



American Forestry

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YOUR NATIONAL PARKS



DEFORESTATION AND EROSION



RATTLE SNAKES



ROADS OF REMEMBRANCE



FORESTRY AND SOUTHERN COMMERCE



EXPLORING THE GARDEN



MOUNTAIN PRODUCTS

The American Forestry Association

Washington, D. C.

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IT IS A VOLUNTARY organization for the inculeation and spread of a forest policy on a scale adequate for our economic needs, and any person is eligible for membership.

IT IS INDEPENDENT, has no official connection with any Federal or State department or policy, and is devoted to a public service conducive to national prosperity.

IT ASSERTS THAT forestry means the propagation and care of forests for the production of timber as a crop; protection of watershed; utilization of non-agricultural soil; use of forests for public recreation.

IT DECLARES THAT FORESTRY is of immense importance to the people, that the census of 1912 shows our forests annually supply over one and a quarter billion dollars' worth of products;

employ 725,000 people; pay \$267,000,000 in wages; cover 850,000,000 acres unsuited for agriculture; regulate the distribution of water; prevent erosion of lands; and are essential to the beauty of the country and the health of the nation.

IT RECOGNIZES THAT forestry is an industry limited by economic conditions, that private owners should be aided and encouraged by investigations, demonstrations, and educational work, since they cannot be expected to practice forestry at a financial loss; that Federal and State governments should undertake scientific forestry upon National and State forest reserves for the benefit of the public.

IT WILL DEVOTE its influence and educational facilities to the development of public thought and knowledge along these practical lines.

It Will Support These Policies

National and State Forests under Federal and State Ownership, administration and management, respectively; adequate appropriations for their care and management; Federal co-operation with the State, especially in forest fire protection.

State activity by acquirement of forest lands; organization for fire protection; encouragement of forest planting by communal and private owners, non-political departmentally independent forest organization, with liberal appropriations for these purposes.

Forest Fire Protection by Federal, State and fire protective agencies, and encouragement and extension individually and by co-operation; without adequate fire protection all other measures for forest crop production will fail.

Forest Planting by Federal and State governments and long-lived corporations and acquirement of waste lands for this purpose, and also planting by private owners, where profitable, and encouragement of natural regeneration.

Forest Taxation Reforms removing unjust burdens from owners of growing timber.

Closer Utilization in logging and manufacturing without loss to owners; aid to lumbermen in achieving this.

Cutting of Mature Timber where and as the domestic market demands it except on areas maintained for park or scenic purposes, and compensation of forest owners for loss suffered through protection of watersheds, or on behalf of any public interest.

Equal protection to the lumber industry and to public interests in legislation affecting private timberland operations, recognizing that lumbering is as legitimate and necessary as the forests themselves.

Classification by experts of lands best suited for farming and those best suited for forestry; and liberal National and State appropriations for this work.

AMERICAN FORESTRY

THE MAGAZINE OF THE AMERICAN FORESTRY ASSOCIATION

WASHINGTON, D. C.

PERCIVAL SHELDON RIDSDALE, Editor

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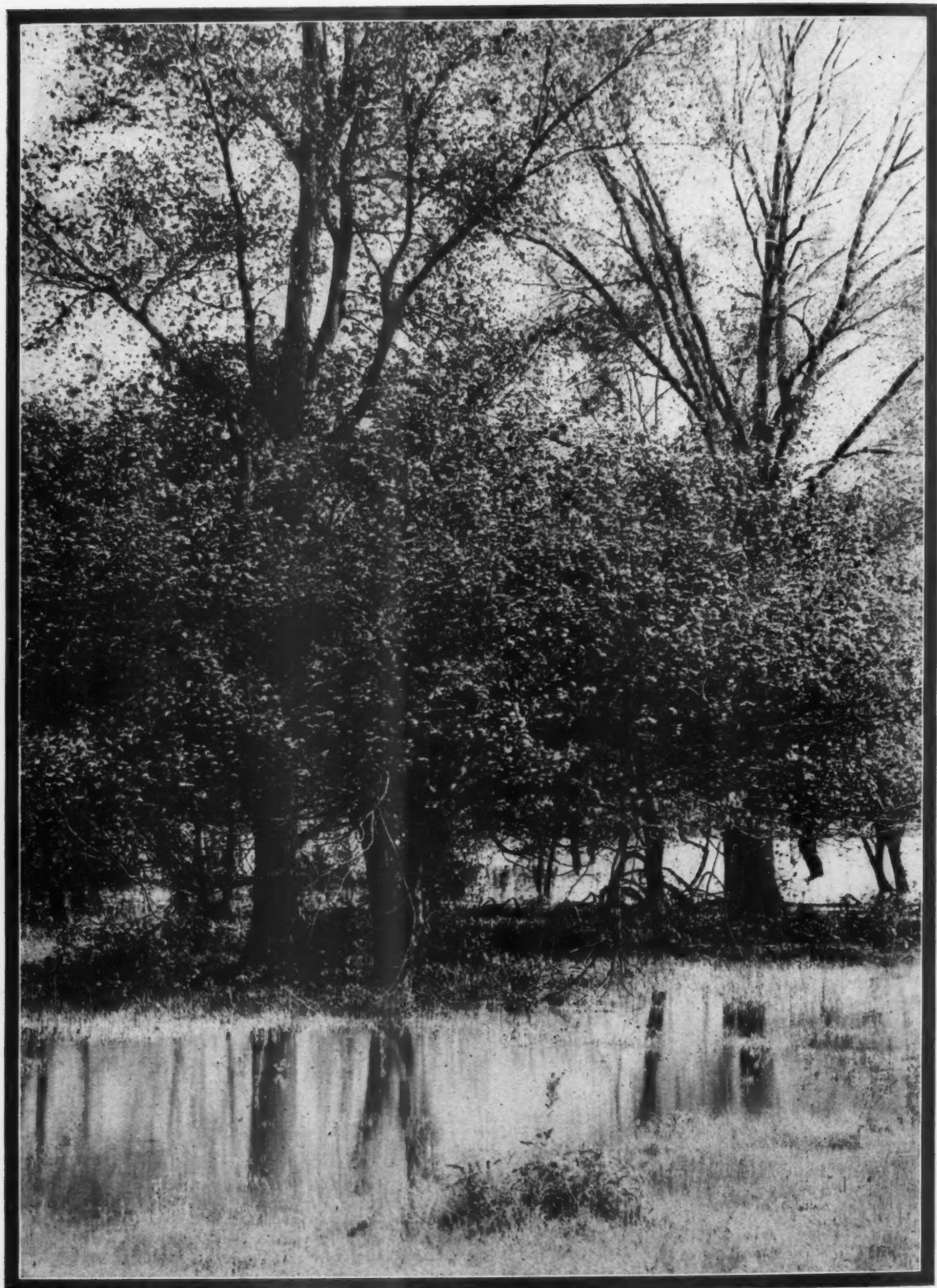
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CHANGE OF ADDRESS

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Be sure to give your old address as well as the new one.

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"WHEN HAWTHORNES BLOOM"

Photograph by Eugene Hall

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RATTLE SNAKES

By Will C. Barnes

MANY years ago in Central Arizona a small body of United States Cavalry was camping for the night at a desert water hole. With the troopers was a pack train of about forty mules manned by the usual force of civilian packers.

After supper each man selected a spot on which to lay his blankets for the night—for in that climate tents were an unknown quantity.

The Chief Packer, an old timer in the Southwest went to considerable trouble to make himself as comfortable as he could and after his bed was all made he went to his saddle, a regular cowboy affair with huge tapaderos, and took from it a hair rope tied to his saddle horn, in a close coil.

This rope was about thirty feet long and of the usual type of hair rope made by the cowboys of those days either from horse or cow tails as was most convenient.

This hair rope he carefully laid on the ground clear around his bed and about a foot from it at every part.

I was a "stranger in a strange land" in those days, a tenderfoot of the first water therefore privileged to ask of the Chief Packer "why" as I pointed to this hair rope stretched about his bed.

"To keep out rattlers" was his prompt reply, "no rattler's going to cross a hair rope under any circumstances."

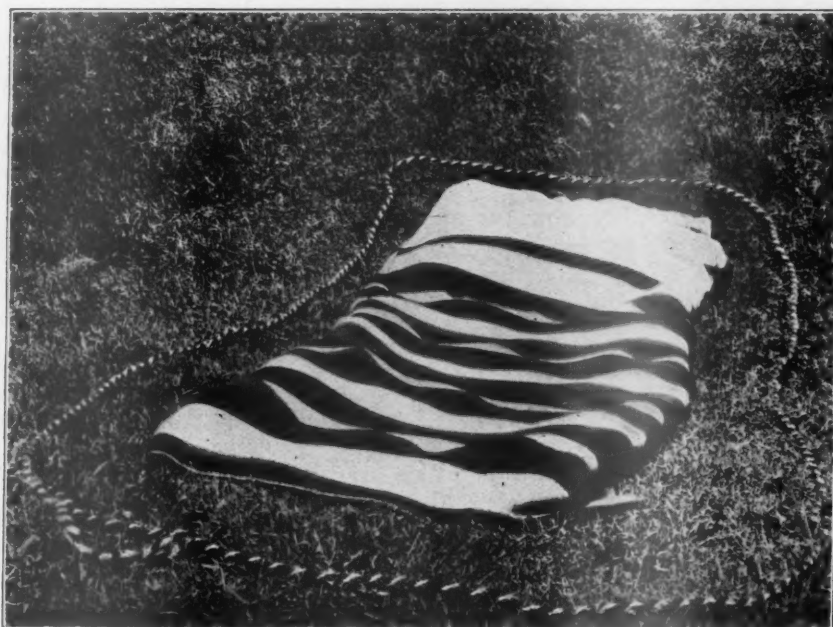
Again my inquisitive "why?"

"Oh, it scratches their belly, I reckon," answered the man as he stepped inside the charmed circle and began his simple preparations for the night's rest.

Evidently my face showed either doubts as to the efficacy of the rope or desire to learn more about the anti-snake fence he had erected about his desert bed room.

"Never heard of that trick?" he continued. I never had. "Well, Sonny, you knock around on the frontier a few years and you're likely to see it done a good many times."

Thirty-five years of frontier life leading me all the way from the Mexican border to the Canadian line, most of it spent in the "open" camping wherever night overtook me, justified the prediction of my packer friend for I have seen the all encircling hair rope used by people of every kind, army officers, prospectors, sheep herders, cowboys, hunters and tenderfeet of every grade. Often I myself have



Photograph by Will C. Barnes.

THE FRONTIERSMAN'S BED PROTECTED (?) FROM THE RATTLER'S FRIENDLY VISITS

The hair rope is the usual cowboy rope of alternate strands of black and white horse hair, and the general belief has always been that the rattler will not, for some peculiar reason of his own, cross it.

surrounded my camp bed with the snake defying contrivance.

Yet not for many years did it occur to me either to question the value of the protection afforded by the hair rope or ask the users of it if they really knew it would perform its duties when the opportunity came and a real live rattler appeared at the barrier.

Though I made it my business to ask the pertinent

question often, seldom have I found any one able to vouch for its value.

"Did you ever test it out with a living snake?" has been my constant inquiry and the answer has uniformly been "No."

"Did you ever hear of any one who had tested its value?" was my next inquiry, which ninety-nine times out of a hundred brought the same answer, "No."

The odd man has always said "Yes. I heard of a man who said he knew a man who tried it out." "Yes, yes," I have answered eagerly, "what happened? Did it turn the snake?" "Oh," he said, "it turned the snake all right" was the ready response.

Out of hundreds of inquiries I never was able to find a single person who had first hand information on this subject. So I finally began to carry a hair rope on my saddle horn intending to demonstrate the truth or falsity of that piece of folklore in a way that would admit of no possible question.

Spending from three to five months each summer on horseback in the far West I deemed it an easy matter to have plenty of opportunities for such a test nevertheless no sooner had I started in on the plan than the rattlesnakes all seemed to have disappeared from sight and in six years of horseback travel I "met up" with but half a dozen rattlers, two in Arizona, one in New Mexico, two in California and one in Utah.

The New Mexico chap was a lusty fellow and leaving the Forest Ranger who was with me to hold him at bay I chased back to where we had left our horses only to discover that the hair rope was gone, someone having taken it from my saddle to tie a horse in camp and I had left without it. It was ten miles to camp so we missed this chance.

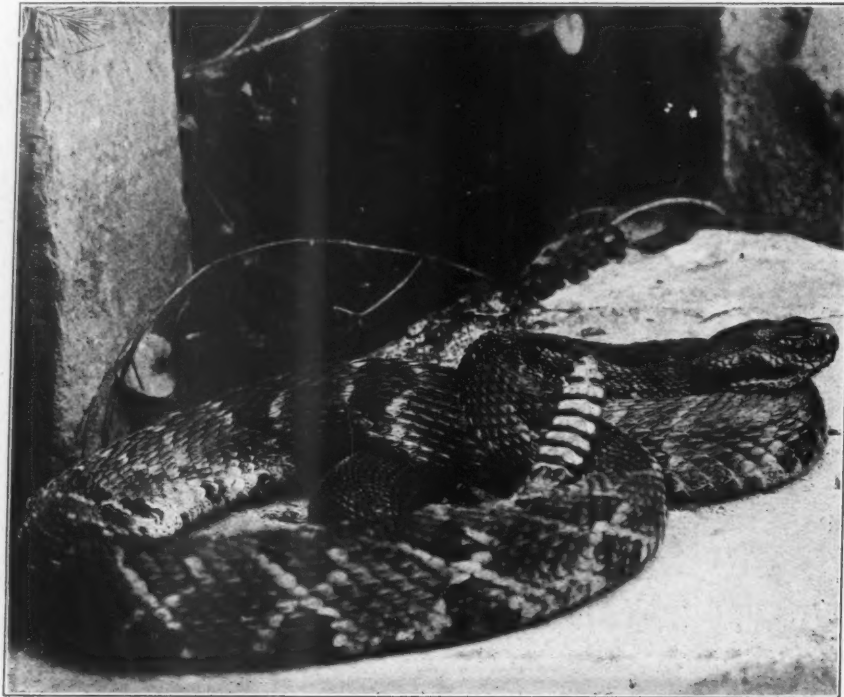
The next snake I "met up" with was in the Mogollon Mountains of Arizona, but his snakeship was in such a rough, rocky, lava formation that we could not lay the

rope where it must either be crossed or stop his progress.

The third got clear away from us under a large rock but the fourth and fifth in the high Sierras of California and the last in southern Utah each submitted to the test

and proved the belief in the hair rope as a safety first for rattlers was not well founded for they each went over the rope wherever they met it. Great care was exercised not to disturb or tease each snake in order that his condition might be as nearly normal as possible.

We laid the rope in a straight line where the snake must either cross or go around the end to avoid it. in large and small rings about him and even when he



Photograph by J. F. Street.

A DIAMOND BACKED RATTLER—READY FOR BUSINESS

An unusually fine specimen fully six feet in length and as large about the "waist" as a man's arm. Of all the rattler tribe, the diamond back is the most subtle and savage. Few of them can be coaxed to eat in captivity and they are always ready to fight.

was moving from us without any attempt on our part to direct his way or annoy him the rope was thrown in front of him over and over again without hindering his movements in the least. He went "over the top" each time with absolutely no hesitation or reluctance.

Of several photographs taken we secured one or two rather good ones showing the snake in the act of crossing the rope which, by the way, was an exceedingly rough hairy one, built to scratch if ever a hair rope was.

Several men whose belief in the theory was almost sublime insisted that the snake went over the rope by elevating his body in the form of an inverted U so that no part touched the rope. The picture shows this not to have been the case, nor did we observe any such effort on the part of the snake. If this action was true it of course knocked on the head the whole theory of safety inside the rope. Thus has systematic investigation and observation wiped out another myth of the plainsmen. Cast into the discard along with the equally prevalent notion regarding the family and familiar relations said to exist between rattlers, Prairie dogs and owls.

Not long ago a well known writer made the statement that although he had spent many years in portions of the United States presumed to be well populated with rattle-

snakes, yet he had never known personally of any one being bitten by one of these reptiles and dying from its effects.

Personally out of a dozen cases of people being bitten by rattlesnakes coming under my direct observation, two of them have died.

Among my business ventures was a "Curio" store in the city of Phoenix, Arizona, where we bought many hundreds of baskets from the nearby Indians. One day an Indian brought in a gunny sack two large wicked looking rattlers. He seemed so cast down at our refusal to buy them that he was finally given two bits for the two which for safe keeping were dumped into a box covered with wire netting.

Phoenix was full of winter tourists and the two snakes attracted considerable attention, so much so, that we had a glass covered case made for them and they were regularly installed as part of our "scenery" and they certainly justified their cost.

Unfortunately, however, for our peace of mind the Indian who sold us the first two, spread the good news and we soon found ourselves facing a serious problem, for snakes were daily coming to us in large and small assortments, covering every kind of snake known in that part of the world.

We wanted to encourage the Indians into bringing us their basketry work, so to keep them good natured we established a regular price of twenty-five cents a head for rattlesnakes, no matter how large or small, but we had to draw the line at all other kinds of snakes.

Thus we soon acquired so many that we began to seek an outlet for them which we did through an advertisement in

an Eastern sporting paper. This brought us orders from every part of this country and many cities in Europe.

Gila Monsters were added to our live stock investments and it was seldom we had less than fifty rattlers or a dozen Gila Monsters on hand at once. Occasionally the demand would be so great as to leave us without a single specimen.

We kept the most of them in a large open cage out of sight of the public but had a fine glass covered cage which held half a dozen unusually large specimens which we placed in the store for public inspection.

Among other visitors to the snake case was a French man named Michael Bourgenon. He was an educated man with a scientific bent, who had travelled all over the world, being especially interested in animals of all kinds. He was a regular correspondent of several scientific journals.

A few weeks before the incident here related Bourgenon attended the wonderfully interesting and impressive Snake Dance given by the Hopi Indians of Northern Arizona. He came to Phoenix from this ceremony thoroughly convinced that he could handle rattlers quite as easily and safely as did the Hopi devotees in their rites.

At that time we had an unusually fine specimen of a Diamond Back rattler, full six feet in length and as large about the "waist" as a man's arm. Of all the rattler tribe the Diamond Back is the most surly and savage.



ANOTHER MYTH EXPLODED

The lower picture shows the rattler well within the hair rope, which legend has always claimed he would never cross, a fallacy of which the upper insert is "documentary evidence."

HE CROSSED IT NOT ONLY ONCE, BUT SEVERAL TIMES

Photographs by Will C. Barnes.

Few of them can be coaxed to eat in captivity and they are always alert and ready to fight.

On September 29, 1898, about 10 A. M., Bourgenon opened the cage door and in spite of all warnings as to the temper of the big fellow insisted on taking the snake from the cage by means of an affair which we used for such purposes.

With the snake out of the cage Bourgenon undertook to try out his theory that the rattler was easily handled if one only went about it in the proper manner. He had seen the Hopi snake dancers pick them up over and over again and noticed that they never attempted to touch them when coiled but teased them until they struck and then before they could recoil caught them deftly behind their triangular shaped heads and the snakes were harmless.

Accordingly Bourgenon laid the big snake on the ground near the cage and teased it until it struck savagely throwing itself as far as any snake can which is never more than one half its length, generally less. He was successful in his first attempt and caught the snake just as he had planned close to its huge head.

Holding it firmly in his right hand he began to stroke the snake with his left. "See," he proudly exclaimed, "I stroke zee belly of zee snake and make him gentle."

Meantime the now thoroughly enraged snake writhed and twisted his rattles making a racket that was fairly blood curdling even to us accustomed to the sound. In its thrashings the snake managed to get a coil or two about the man's arm which undoubtedly gave it a most powerful leverage for suddenly we saw his body begin to slip through Bourgenon's right hand until the head was fully eight inches from the hand. Just how it happened no one could say positively but as he was endeavoring to grasp the reptile closer up to the head with the other hand, the snake sank its fangs deep into the man's right hand between the thumb and forefinger, the huge mouth spreading so wide that when closed on the hand the lower

jaw was under and the upper, with the deadly fangs, on the upper side of the hand, the fangs driven deep into the flesh directly over the large veins that lie between the thumb and forefinger.

With a shriek of terror the Frenchman tore the snake loose with his other hand, leaving one of the fangs buried in the flesh of the stricken hand.

While one man caught the snake and returned him to the cage another grabbed the arm of the now thoroughly terrified Frenchman and with a knotted cord quickly placed a tourniquet about the wrist, twisting it with a lead pencil until it sank deep into the flesh. The lance-like fang was worked from the flesh with the blade of a knife after which the flesh all about the tiny wound was slashed a dozen times in order to make it bleed freely.

Meantime the Frenchman sucked the wound vigorously, his lips being free from any sores or cracks, rattlesnake poison being absolutely harmless if swallowed.

The man, however, had lost his air of bravado and was completely terrorized. In those days we knew nothing of permanganate of potash and whiskey was the only known remedy.

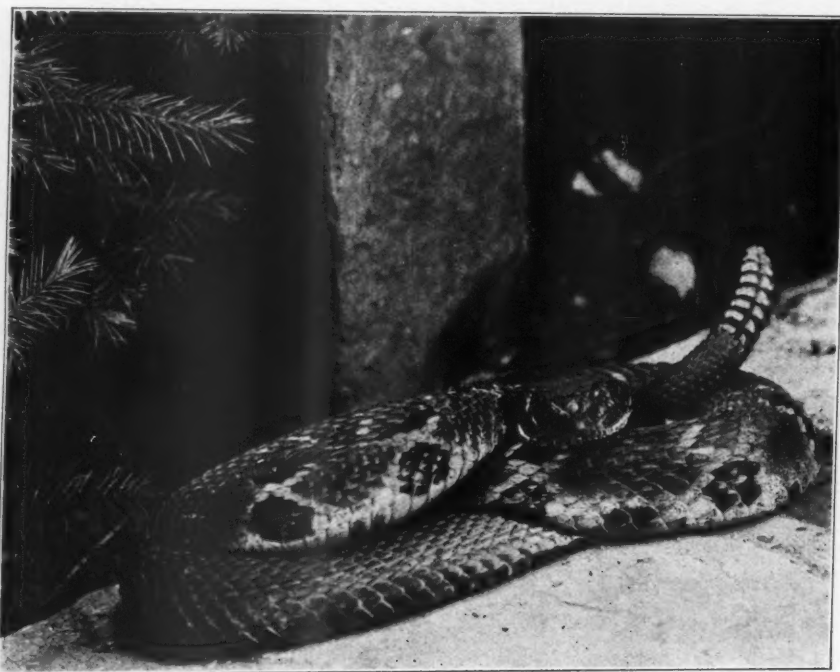
The effect of the tourniquet caused the man so much pain

that we placed another higher up on the arm and took off the one at the wrist.

By this time he was a pitiable sight, and although two doctors did what they could to counteract the effect of the poison the man was dead at 2 P. M. the following day, September 30th, 1898.

His arm began to turn a purplish blue inside of an hour and this condition spread rapidly to every part of his body until, when he died, there was hardly a white spot on him. He died in great pain and although he drank great quantities of whiskey was not by any means "dead drunk."

This sad incident led to the placing of a lock on the "snake den" in order that no more would-be "snake charmers" might attempt to emulate the Hopi Indians.



Photograph by J. F. Street.

A POWERFUL DIAMOND BACK—FACE TO FACE

This big fellow is a terrible enemy at all times, with a terrific temper and extremely dangerous when aroused. His bite carries the most deadly venom which, strangely enough, is quite harmless when swallowed.



Photograph by J. F. Street.

AN UNUSUAL POSE

A splendid specimen caught by the camera in a most unusual and striking pose—practically standing upright.

On May 24th, 1899, a prominent citizen of Phoenix, Mr. M. H. Williams, a lawyer and at the time District Attorney for Maricopa County, Arizona, was at some well known Hot Springs, a short distance from Phoenix.

The buildings at the Hot Springs were rather primitive and the one occupied by Mr. Williams was of adobe with the usual dirt floor of that class of house. Sleeping on a low cot Mr. Williams awoke one morning, threw back the bedding and swung his legs out of the cot and onto an angora goat skin lying on the floor. Coiled up on the rug was a rattler of the "side winder" kind, known to scientists as the "horned rattler" from small horn-like protuberances on each side of its head.

Mr. Williams' right foot landed squarely on the coiled snake which sank its fangs deep into the instep. Although everything possible was done to save his life Mr. Williams died in great agony within eight hours from the time the snake struck him.

In addition to these two deaths I have personally

known half a dozen men and one woman who were bitten but recovered.

The last was a forest ranger named Blood, in the Sierras of California during the summer of 1919. He was hunting near the little hamlet of Northfork when a squirrel in a tree caught his eye. Gun in hand he was walking slowly around the tree looking for the little animal above him. He stepped fairly onto a big Diamond Back whose frantic rattling caused him to jump to one side. The Ranger was wearing a low shoe and as he raised his foot the snake lunged viciously at him, striking the leg just above the ankle bone, the fangs both penetrating the flesh through the sock and under drawers.

His wife who was with him quickly made a tourniquet and placed it above the knee, then helped her husband to a camp nearby where with a razor blade the wound, plainly visible, was deeply slashed, causing an excessive flow of blood.

A phone message to the village brought a syringe and some permanganate solution which was plentifully injected into the flesh in the vicinity of the wound, about thirty minutes after the bite was inflicted.

The leg by this time was frightfully swollen and the man in great pain.

The tourniquet was loosened about every thirty minutes and the blood allowed to circulate for a few seconds in order to allow the poison to enter the venous system in small amounts, which was all done in strict accordance with the most modern methods of treating snake bites.

The nearest doctor was at Fresno, sixty miles away. He could not leave home but after hearing what treat-



Photograph by J. F. Street.

THE SIDE WINDER RATTLER

This rattler is known to scientists as the "horned rattler" from the small horn-like protuberances on each side of its head. Note the frog in the mouth of the snake, being quickly devoured.

ment had been given said everything was being done that was possible and his presence was unnecessary.

Inside of twenty-four hours the man's whole leg was frightfully swollen, clear to the hip and had turned a dark ugly blue. He was in great pain and the feeling was as if the skin was being torn from his bones by red hot pincers.

The maximum was reached about the third day and from that time the discoloration gradually subsided although at thirty days there were large blue blotches on the hip and upper leg. Mr. Blood was unable to bear his weight on the foot without pain for nearly six weeks, and was bedridden for three full weeks.

One of the most interesting cases was that of the well known author, explorer and scientist, Mr. George Wharton James.

In the summer of 1901 Mr. James attended the Hopi Snake Dance, a ceremony he had witnessed several times before during his many years in Arizona.

Mr. James was deeply interested in rattlesnakes, had dissected many specimens, handled living ones frequently and was at this time studying the problem of an antidote for their bite.

Returning from the dance he visited Phoenix where he was anxious to secure a quantity of the poison from the rattlers in our possession. Fearful of the results he was urged not to undertake the job but he insisted he could handle them without any difficulty or danger.

Rather reluctantly he was given the key to the cage. At that time we had an unusually large and active Diamond Back about five and a half feet long. Mr. James grabbed his snakeship in the usual manner, about the neck just back of the head.

The snake showed fight from the first and the crowd about him watched the affair with intense interest.

Mr. James, perfectly cool and collected, asked us all to observe the animal's actions. Slowly the snake prepared to defend himself in his own way.

His mouth was opened to its uttermost extent, the jaws almost at right angles to the body, the ugly fangs unhinged and erect, the enveloping sheath slowly receding from them. Meantime he was apparently slipping slightly through the man's thumb and finger, so much so that he gained considerably in length above the grasp. It was probably a muscular elongation and possibly to some extent the body of the snake slipped through the almost vise-like grip in which he was held by the mere muscular contraction and expansion of the struggling reptile.

Suddenly with almost lightning-like rapidity the snake gave its head a peculiar twist which threw its upper jaw into such a position as to allow it to make what may be called a side swipe at the lower part of Mr. James' thumb.

Only one fang touched the flesh, but so strong was the stroke that the needle-like weapon sank deep into the fleshy part of the thumb and with a downward slash it tore a sliding gash across the member, an inch long and three-quarters of an inch deep.

Never for a second did James lose his nerve and he was the coolest man in the party. Still hanging onto his snake he called on every one to note certain elements of the attack.

His thumb and wrist were drenched with the poison, but he pointed to the fact that it had all come from the fang that made the wound. He pried the snake's mouth open and pointed out to the almost breathless onlookers the empty gland or sac on one side and the full one on the other.

Wounded, though he was, the scientist in James was stronger than the fear of a fatal result. There had always been the belief that the ejection of the poison was involuntary, that the very act of striking and sinking the fangs into anything carried with it the expulsion of the poison.

The fact that in this instance only one sac had been emptied convinced James that the snake absolutely controlled the matter and that in his case at least, the snake only released the poison that found its way through the fang which did the work.

Still holding the snake Mr. James, wholly unmindful of his wounded thumb manipulated the head so that he secured over half a teaspoon of the poison from the full sac which was poured into a small vial he had provided for the purpose.

Then, and not until then, did he throw the snake back into the cage and allow his wound to be looked after.

A tourniquet above the elbow was the first thing, followed by liberal injections of permanganate with continued applications of the hottest water he could stand.

The usual discoloration set in with terrible pains and extreme soreness, especially in the abdomen, and for several days he was a mighty sick man and it was about two months before the hand and arm could be used.

I firmly believe the only thing that saved him from death was the fact that the point on the thumb where the long, deep wound was made, was without large veins so that the poison did not quickly enter the venous system. Otherwise nothing could have saved him for it was at least three full minutes after the snake struck before James ceased his scientific investigations and made any effort to save himself from a frightful death.

Recently I wrote Mr. James about his experience and especially as to the after effects.

"The after results were singular," he writes. "For over eighteen months my stomach swelled and solidified every two or three months; was as sore all over as a boil, and suffered intense agony for several days and then would pass off. Some one advised me to go to the famous Passo Robles mud springs in southern California. I did so and took a mud bath daily for ten days and have never had a recurrence of the attacks."

This aftermath of Mr. James' incident recalls the well authenticated case of a man named Shindler, an employee of the National Museum at Washington, D. C. On June 1st, 1882, Shindler was bitten on the finger by a small coral snake. Violent pains followed, but in a



Photograph by Will C. Barnes.

HIS PROTEST WAS HIS HIS UNDOING

When his warning rattle was sounded, a piece of rope caught the noisy gentleman.

few days the man was apparently fully recovered. Every year, however, for twelve succeeding years, on the date of the original bite, the pains returned, a sore formed, the sore would burst and the nail of the finger invariably came off. This process usually took about two weeks from beginning to end.

Finally he learned of a Brazilian snake cure, an herb or vine "*Micania Guacho*," the leaves and stem of which when made into an infusion and taken internally just before the annual visitation caused a cessation of the sore finger and the loss of the nail but up to last accounts obtainable the pains still continued on each anniversary but not for so long, nor were they as intense.

An equally interesting case is that of a Mexican boy in Phoenix, Arizona, named Teodoro Ruiz. My first knowledge of this case was in November, 1911, when the boy, then about twelve years of age, was found wandering alone on the desert, a few miles from the city, by a passing driver who, unable to get the lad to talk and realizing something was wrong, took him in his buggy and left him at the Sheriff's office when he reached Phoenix. Attaches of the office knew him well as he had been brought to them before.

Briefly, the boy had been bitten by a rattler about four years previous, from the effects of which he lost completely the power of speech. Before the accident he was a perfectly normal child in every way. Each year, however, since the day he was bitten, as the date nears on which he received the rattler's venom into his system, his whole demeanor changes, he becomes restless and unless carefully watched leaves his father's home and alone and on foot takes to the desert where he wanders aimlessly about picking up and playing with bugs, toads,

lizards and any such thing he sees. Unfortunately no one has ever followed the boy to note whether or not he finds and handles snakes while in this condition.

Generally his distracted parents rescued him from the desert or some one finding him there brought him back to them for his story was known to every one.

He seldom offered any objection to such action on their part the wanderlust evidently being soon satisfied.

Always there are questions as to the fangs of rattlers. Briefly, they are sharp as needles and hollow, the poison being ejected from the sac behind or at the base of each and through this thread-like opening that runs down the center of the fang.



Photograph by J. F. Street.

THE RATTLER'S FANGS

The fangs are as sharp as needles and hollow, the poison being ejected from the sac behind or just at the base of each, and through this thread-like opening that runs down the center of the fang.

In repose the two foremost fangs lie close to the jaws encased in a fleshy covering or sheath. Under excitement they emerge from this sheath and quickly rise to the upright position in which they are always pictured. If a main fang is artificially removed or accidentally broken the next one gradually moves forward and takes its place.

Dr. Weir Mitchell who spent many years of his most industrious and valuable life studying snakes and especially rattlers, in discussing this matter says there are

(Cont'd on Page 396)

DEFORESTATION AND EROSION

By S. W. McCallie, State Geologist of Georgia

THE configuration of the earth's surface as we see it today is due largely to the erosive action of running water. The hills, the ridges, and the mountains, as well as the intervening valleys, owe their origin to this destructive agent.

Rain as it falls on the surface of the earth is either evaporated, taken up by the soils, or runs off from the surface to swell the streams. Only that part of the rainfall last mentioned is discussed in this article as it alone has direct bearing on the subject under consideration.

The amount of surface run-off of rainfall of any

cipitated mostly in the form of hard showers, and steep hill slopes to accelerate the flow of water, thereby greatly augmenting its erosive effect. Illustrations of the erosive effect of rainfall are here seen in a most striking manner on every hand. Thousands of acres in this region within the last few years have been made worthless for agricultural purposes by the destructive agent of rain wash, as a result of the removal of forests.

Some idea of the destructive effect of rain wash may be had by the study of the individual streams which drain that region. The Savannah River, for instance, is a good



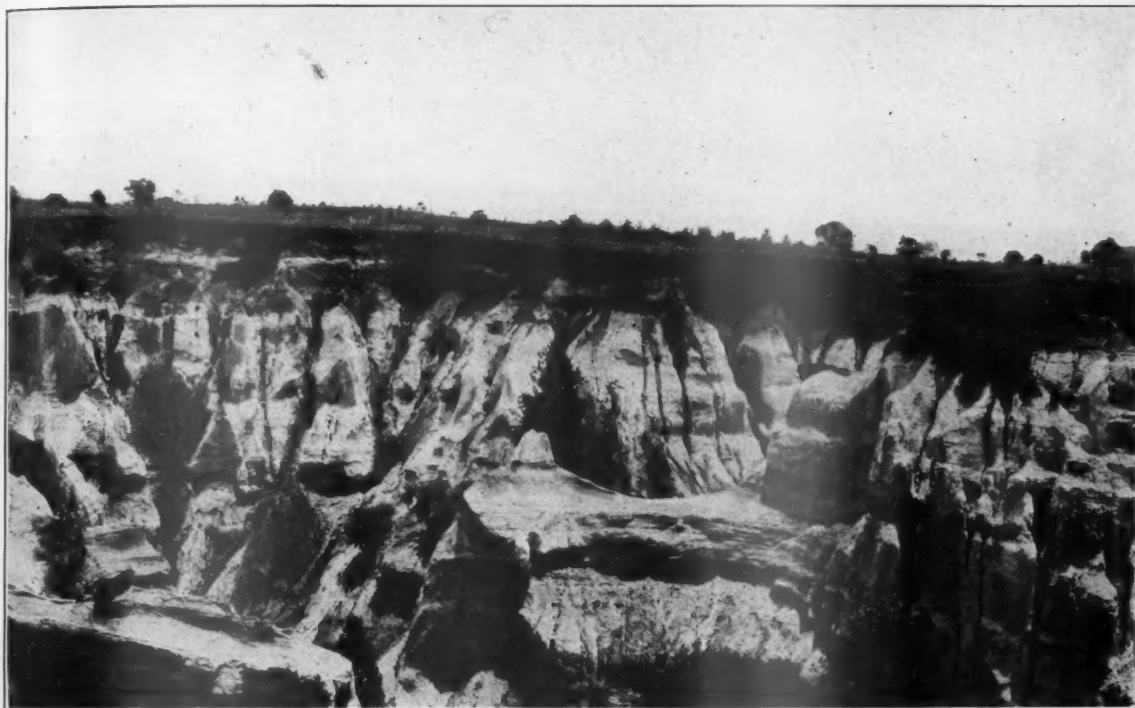
IMMENSE ERODED GULLEY IN THE MOUNTAINOUS SECTION OF NORTH GEORGIA SHOWING HOW THE VEGETATION STOPS THE EROSION BY CHOKING THE GULLEY

given region depends chiefly on three conditions, namely, the rate at which the rain falls, the porosity of the soil, and the slope of the surface. In other words, the maximum erosive effect will take place when the rainfall is in hard showers on steep hill slopes with only moderately porous soils. On the other hand, in the case of a long continuous, slowly, falling rain, extending through many hours, the total amount of rainfall may be quite large but the run-off will be small or negligible.

Applying the principles above enumerated to Georgia, we find that surface erosion is most active in the northern part of the state. Here we find a heavy rainfall pre-

illustration. This river, together with its tributaries, drain much of the mountain area of that part of the state. The data which has been collected in the last twenty years by the State Geological Survey and the Federal Survey on the Savannah River shows that at present it is carrying to the Atlantic Ocean annually more than 2,500,000 tons of suspended matter. This means, interpreted in car loads (fifty tons each) that the river is carrying to the sea more than 135 car loads of soil wash daily.

This enormous wash from the drainage basin of the Savannah River is now probably several times greater



HUGE GULLIES, "BAD LANDS OF GEORGIA," NEAR LUMPKIN, STEWART COUNTY, SOUTH GEORGIA. ONLY A FEW YEARS AGO THE POSITION OF THESE GULLIES WAS OCCUPIED BY A FERTILE COTTON FIELD

than it was originally before the lands were cleared for agricultural purposes.

There appear to be only three practical methods open to man to retard the wash of the soil, namely, terracing,

deep plowing and the protection of the forests. The forest, including vegetation in general, is a great protector of soils from the erosive action of rain wash. The vegetable matter accumulating upon the surface



HUGE GULLEY IN MIDDLE GEORGIA SHOWING IN THE DISTANCE A CORN FIELD BEING ENGULFED. THIS LAND IS RAPIDLY ON THE WAY TO THE CONDITION OF THAT SHOWN ABOVE

not only protects the soil from the beating action of the rain drops, but by retarding the run-off, it causes much of the water to disappear under ground or permits it to evaporate from the surface.

While the most widespread land wash of the state is to be seen in the mountainous section where the forests have been removed, it is not by any means confined to that section alone. We have remarkable instances of soil erosion in the Wilmot gulley near Thomaston in middle Georgia, and in the noted gulley near Lumpkin in the Coastal Plain. The huge gulley here referred to attain a depth in places of sixty feet or more, and are seen traversing fields which less than fifty years ago were cultivated in cotton. The primary cause of these huge gulley is the cutting away of the forests from the steep hill slopes which border the valleys of the small

streams.

It is interesting to study the life history of a gulley in the uplands of the Coastal Plain. They have their beginnings in small washes that make their appearance soon after the forests are removed from the hill slopes. From year to year the gulley increases its length and depth. The downward cutting continues until it approximates the base level of the valley below. Here the water ceases to deepen the gulley but spends its energies in widening its lower end. At this stage of its life history vegetation in the form of old field pine, blackberries, etc., begin to grow in the lower reaches of the gulley. Erosion now ceases and a soil is formed.

Here we have a life history of a gulley produced by the cutting away of the forest on the hillside and arrested by the same agency. A case of nature healing its own wound.

RATTLE SNAKES

(Cont'd from Page 393)

generally from eight to ten reserve fangs and that frequently this replacement process takes several weeks.

Dr. Mitchell also refers to the popular idea of a "hiss" which every snake is believed to possess. In the case of rattlers he says that repeated experiments satisfied him that with this class of snakes this hissing sound is the air expelled from the reptile's body by the violence of its muscular effort in casting itself forward to strike its victim and not a method or process of its protective or combative system.

As for the famous caudal appendage of the rattler, both Dr. Mitchell and Dr. Stejneger of the Smithsonian Institution agree that a button requires about two or three months to grow to its maximum size, the summer growth being more rapid than in winter, that the first button, or rattle, is present when the snake is born and at sixteen months a caged rattler in Dr. Mitchell's collection had six rattles. One or two come off with each shedding of the skin—an annual occurrence—and are frequently broken or injured or come off naturally so that they bear no possible relation to the age of the wearer. The rattles are an indication of the snake's condition; well fed they are large and grow fast, but under starvation the rattles are small and grow very slowly.

Occasionally in our snake cages we would discover some morning all the way from five to a dozen little snakelets. There always followed a vast amount of discussion as to their mode of birth.

"From eggs just like a bird," declared some who quoted various experience to prove it. "From their mother just as puppies are" vowed others who offered equally convincing proof as to their claims.

A study of the authorities, Drs. Ditmars, Mitchell,

Stejneger and others, proved each to be right—within certain limitations.

The facts are that as with some flies so some snakes, such as water snakes, garter snakes, and rattlers, are viviparous, i. e., they bring forth their young alive, while bull, black and gopher snakes and others of this class are oviparous and their offspring comes into this world via an egg, just as birds and turtles do.

If bitten by a rattler do not lose your head. First place a ligature on the limb between the wound and the heart. If on the body where such a thing is not possible your chances for recovery are greatly lessened.

Second, scarify the wound with a keen knife, knead the flesh so as to encourage bleeding which really washes the poison from the wound, suck it vigorously, if your lips and mouth have no broken places.

Don't leave the ligature in one place or closed down for more than ten or fifteen minutes without loosening it for a moment to allow the blood to flow. This permits the poison, if in the veins, to enter the rest of the body in small amounts and minimizes its effect.

Do everything to produce profuse sweating in the patient. Give alcohol only in small doses, a teaspoonful at the most, avoid ammonia as a stimulant and never give doses of whiskey except as alcohol. "People do not recover from snake bite," agree all these authorities, "because of the whiskey used, but in spite of it."

And, finally, don't undertake to emulate the Hopi Indian. He and his ancestors for a thousand years back—for four hundred of which we have authentic records—have been handling and "worshipping" these reptiles and even they are not infrequently the victims of misplaced confidence and are bitten and seek refuge in their mysterious and so far unknown cure.

EDITORIAL

SPEAK A WORD FOR FOREST EXPERIMENT STATIONS

THE time for talking in support of forest experiment stations ought to be long past, as it is in the case of agricultural experiment stations. Unfortunately, such is not the case. A lot of talking remains to be done, and if foresters and those interested in forestry do not do it, who will?

The fact that the need for forest experiment stations is obvious to the forester does not mean that it is equally obvious to other people. The present status of forest experiment stations is proof thereof. As a matter of fact, the conception of a forest experiment station held by the man in the street is about as clear as a foggy night. Appreciation of the need for experiment stations is imperative because they are as necessary to the progress of forestry as agricultural experiment stations are to the progress of farming. Without adequate and properly equipped experiment stations, we can not hope to handle the forest problem efficiently and economically.

There has been much talk pro and con about forest fires, taxation, legislation, the need for this, and the need for that, but relatively little has been said for forest experiment stations. Perhaps it is because the need is so obvious. We hope so but are inclined to be skeptical in view of the present status of forest experiment stations in this country. We have to deal with some 463,000,000 acres of forest land. Some of it is well forested, a large part of it is poorly forested and over

80,000,000 acres is an idle waste. We have got to learn how to make this land most productive in producing timber. To do that we have, among other things, got to attract private capital to it. The surest way to do that is to demonstrate what these lands are capable of doing in the way of forest production. We could, to be sure, go ahead on a guess and try plan and make some very costly mistakes and encounter many delays in solving the many problems involved. One may search all night in the dark for a penny which he could have found in a few seconds with a tiny light.

Foresters are quite often criticized because they can not make definite statements or predictions with respect to forest growth and forest practice under many conditions. They would be foolish in attempting to do so where definite knowledge is lacking. Forestry and the utilization of forest lands in this country must be worked out through the forest experiment stations in exactly the same way that agriculture is being developed through the agricultural experiment stations. The area of improved farm lands in the United States is only slightly in excess of the area of forest lands. The farm lands are producing annually products ten times greater in value than the forest lands, but the Government is spending for agricultural experiment stations and for agricultural research one hundred times the amount it is spending for forest experiment stations.

FEDERAL TAXATION OF FOREST PRODUCTS

THE recent decision of the Supreme Court of the United States, declaring the Child Labor Tax Law to be unconstitutional, is now the subject of much speculation among foresters because of the possible application of the court's decision to certain forestry legislation which has been proposed. That which seems most likely to fall within the scope of the court's decision is embraced in the Capper bill, the constitutionality of which has been challenged by some ever since it was proposed.

A comparison of the principles of the Capper bill and the Child Labor Tax Law indicate that in essential points they are much alike.

The title of the Capper Bill is "A bill to control forest devastation to raise a revenue from forest products, and for other purposes." It includes within its provisions "all private land within the United States which is now or hereafter in forest," and it defines forest devastation as "the harvesting of a forest crop otherwise than in compliance with standards established by regional and

local regulations," which are to be made by the Secretary of Agriculture from time to time "to secure a continuous succession of forest crops of reasonable quantity and quality."

It requires every operator to classify as standard products, or as products below standard, all products produced by him during each year, and to make return thereof. It imposes upon every operator an excise tax on the privilege of harvesting forest crops of 5 cents per thousand board feet in respect of standard products, and of \$5 per thousand board feet in respect to products below standard. It authorizes the Secretary of Agriculture and the Commissioner of Internal Revenue, to cause any officer or agent designated by either of them to examine records, accounts, books, papers, or memoranda. And for untrue classification or false record or evasion of tax it prescribes a fine of not more than \$5,000 or imprisonment for not more than one year or both.

The Child Labor Tax Law provides that every person operating any mill, cannery, workshop, factory, or manufacturing establishment in which children under fourteen

years have been employed shall pay an excise tax equivalent to 10 per centum of the net profits. It authorizes the Secretary of Labor and Commissioner of Internal Revenue, or any other person authorized by either of them, "to enter and inspect at any time any mill, cannery, workshop, factory or manufacturing establishment." The law is held to be invalid by the Supreme Court of the United States, in *J. W. Bailey vs. The Drexel Furniture Company*, May 15, 1922. The Court holds that the law regulates business "by the use of the so-called tax as a penalty," and "is imposed to stop the employment of children within the age limits prescribed."

In its decision the court uses this language: "Grant the validity of this law, and all that Congress would need to do, hereafter, in seeking to take over to its control any one of the great number of subjects of public interest, jurisdiction of which the States have never parted with, and which are reserved to them by the Tenth Amendment, would be to enact a detailed measure of complete regulation of the subject and enforce it by a so-called tax upon departures from it. To give such magic to the word tax would be to break down all constitu-

tional limitation of the powers of Congress and completely wipe out the sovereignty of the States.

"The necessary effect of this act is to regulate the hours of labor of children in factories and mines within the states, a purely state authority. The so-called tax is a penalty to coerce people of a State to act as Congress wishes them to act in respect of a matter completely the business of the state government under the Federal Constitution."

Lawyers are, of course, most competent to interpret this decision in relation to the principles of the Capper bill. If it casts a clear doubt upon the constitutional validity of the tax feature of the Capper bill, the sooner that issue is eliminated the better, because the need of forestry legislation is too urgent to admit of fighting over a form of legislation which has little chance of being upheld by the Supreme Court. It would serve to clarify issues in the fight for national forestry legislation if the advocates of the Capper bill would select a committee of five or seven lawyers of national standing to pass upon the constitutionality of the Capper bill in the light of the decision in the Child Labor Tax Law and then accept the judgment of these legal authorities.

GIFFORD PINCHOT, FORESTER-GOVERNOR

GIFFORD PINCHOT'S record as conservationist and administrator is so well known, particularly to the readers of *American Forestry*, that they will appreciate the impetus to conservation signalized by his nomination as the Republican candidate for Governor of Pennsylvania. Unless the unexpected happens, Mr. Pinchot will become the next Governor of Pennsylvania, because of the normal Republican majority in that state.

Mr. Pinchot is so well informed in conservation matters in Pennsylvania, that he is exceptionally well equipped to assume active leadership in them. It was upon the urgent call of Governor William C. Sproul that he accepted the appointment of Commissioner of Forestry on March 10, 1920, in order that forestry in Pennsylvania could be raised to a standard to meet the State's needs. He took hold of the work aggressively, and in two years of service with the Department of Forestry so aroused public interest and accomplished such far-reaching results in forestry, that the impress has been felt throughout the country.

In his enthusiastic and able manner he obtained public interest and support in forest protection and forest practice unparalleled in any state in such a short time. Stressing the vital need of forest protection from fire, he secured an appropriation of \$1,000,000 for forest protection, an unprecedented record for State work, for the

biennial period June 1, 1921 to May 31, 1923. He also secured legislation authorizing a reorganization of the Department of Forestry along highly constructive lines. An important and significant provision of the Act is that the Commissioner of Forestry and his Deputy, and the heads of bureaus and offices handling technical forest work, must be men of technical training and experience in forestry.

The Pennsylvania Department of Forestry made wonderful progress under Mr. Pinchot's administration which was marked by efficient conduct of business, intelligent leadership, close cooperation with the public, and the spirit of public service. There was no drastic overturn in personnel in the accomplishment of it. Each member of the Department was put to the task for which he was best fitted, and a fine *esprit de corps* developed. A standard of public service was thus created in the Pennsylvania service of the type which has characterized the United States Forest Service since its inception.

In the larger field now open to him, Mr. Pinchot will demonstrate without question the high standards of efficiency, conduct and accomplishment which have marked his entire career. He is amply fitted by training and experience in public service to meet the problems of the Keystone State.



CRATER ON LASSEN PEAK

Photograph copyrighted by P. J. Thompson

Lassen Volcanic National Park, California. Here alone within the borders of the United States may be seen and studied the phenomena of volcanic activity.

YOUR NATIONAL PARKS

By A. E. Demaray

Editor, National Park Service

THE National Parks, set aside by Acts of Congress because of extraordinary scenic beauty, remarkable phenomena or other unusual qualification for "the benefit and enjoyment of the people," are truly the playgrounds of the American people. And it is the policy of the National Park Service of the Department of the Interior, which is the Government Bureau having control of the National Parks, to permit their general use by the public in the manner that best satisfies the individual taste. To that end mountain climbing, horseback riding, hiking trips, motoring, camping, swimming, boating and fishing are actively encouraged. Hotels and permanent camps are available giving a choice of accommodations at rates which are strictly regulated. Excellent roads for motoring, choice camp sites for camping and alluring trails for hiking among scenes of inspiring beauty are awaiting the visitor.

Have you seen God in His splendors,
Heard the text that Nature renders?
(You'll never hear it in the family pew)
The simple things, the true things, the silent men to
do things,
Then listen to the Wild; it's calling you.

At the request of AMERICAN FORESTRY a number of Park Superintendents have been asked to tell of their Park's attractions, and their messages to you follow on succeeding pages.

There are in addition to those described nine other National Parks and it is the purpose of this article to tell briefly of these.

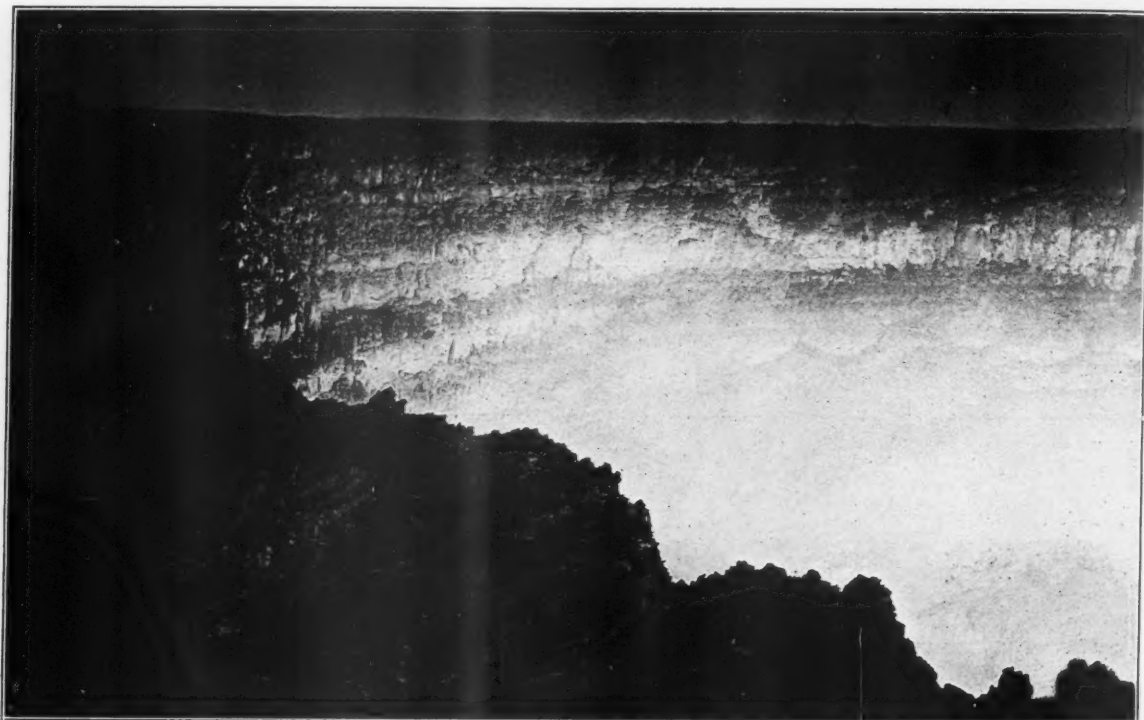
The Hawaii National Park, Territory of Hawaii, includes the summits of three volcanoes of world celebrity—Haleakala on the Island of Maui, and Mauna Loa and Kilauea on the Island of Hawaii. Of the three areas the Kilauea section is the most accessible, being reached directly by automobile from Hilo, the second city of the Territory. The lake of churning fiery lava within the crater of Kilauea forms one of the most spectacular exhibits in the world. The Park is open all the year.

The Mount McKinley National Park, Alaska, is the second largest National Park, containing in its 2,645 square miles the most sensational section of the great Alaska range culminating in Mount McKinley, altitude 20,300 feet, the highest peak in North America. Congress created this National Park, principally to protect its wild herds of caribou, moose and mountain sheep,

The park area is the fountainhead of the game supply of this part of Alaska. The newly completed Government Alaska Railroad closely approaches the northeast corner of the park. McKinley Station is the point of entrance, but travel into the park as yet is only for the most hardy traveler, as there are no roads or accommodations.

The Hot Springs reservation in the Ozark Mountains of Arkansas is really the oldest National Park in one sense, having been reserved in 1832, 40 years before the wonders of the Yellowstone first inspired Congress with the idea that scenery was a national asset deserving of

Lassen Volcanic National Park, California, offers in Lassen Peak, altitude 10,465 feet, the only active volcano in the United States. While its last violent eruption occurred May 22, 1915, steaming mud pots may be observed in its crater. The climb of the cindery summit trail is more than rewarded by the superb view to be obtained. In the far distance Mount Shasta rears its snow-crowned head; occasionally Mount Hood in Oregon may be seen. Within the Park camp accommodations are to be had at Drakesbad reached by road from Chester which in turn is reached from Paxton, California, on the Western Pacific Railroad and from Red Bluff on the Southern Pacific



THE KILAUEA LAKE OF FIRE

Photograph copyrighted by E. M. Newman

One of the most spectacular exhibits in the world is this crater in Hawaii, now visited by many tourists. Photographed at night by the light of its flaming lavas.

preservation for the use and enjoyment of succeeding generations. The City of Hot Springs bordering the park is visited annually by thousands of persons seeking health from the beneficent waters of the hot springs and pleasure in the high and beautiful country with its excellent drives and woodland paths, its mountain and river views, and its exceptional golf. The park is readily accessible by train and by automobile and is open the year around.

Our newest National Park, Zion, in southwest Utah has for its principal exhibit a deep canyon between sandstone cliffs of great height and vivid color. It is reached from either Salt Lake City or Los Angeles, train tourists leaving the railroad at Lund, Utah, for the 100-mile auto drive to the park. From Zion other notable scenic exhibits of this section can be visited including Bryce Canyon and Cedar Breaks and a trip may be extended to the north rim of the Grand Canyon National Park in Arizona.

Railroad. The Park season is from June 15 to September 1.

Wind Cave National Park, South Dakota, in the Black Hills not far from one of Custer's famous battle fields, exhibits a remarkable limestone cavern. The Park has a surface area of 16 square miles a part of which is maintained as a National Game Preserve for bison, elk and antelope. The Park is best reached from Hot Springs, South Dakota, on the Chicago, Burlington and Quincy and the Chicago and Northwestern Railroads. While the Park is open all the year, the tourist season is from June 1 to September 30.

Platt National Park in southern Oklahoma contains sulphur and other health-giving springs, hot and cold, which gush plentifully from its area of 1½ square miles. It lies in a high country of great beauty and delightful climate and is locally extremely popular. Its entrance point is Sulphur, Oklahoma, which is reached by several



Photograph by courtesy of U. S. Geological Survey

MOUNT MCKINLEY, ALTITUDE 20,300 FEET

Mount McKinley rises higher above its surrounding country than any other mountain in the world and offers untold opportunities to the daring mountain climber.

railroads and by a number of good automobile roads.

Sullys Hill National Park, North Dakota, is a Park of picturesque forested hills bordering a lake. It is a

wild animal preserve and has historic associations. It is on the main line of the Great Northern Railroad and is accessible during the summer.

LAFAYETTE NATIONAL PARK

By George B. Dorr, Superintendent

LAFAYETTE National Park is the single eastern representative of our National Park System. It is also the only National Park that borders on the sea and includes ocean waters on a harbored coast among its recreational resources.

With many of us, sprung from sea-faring ancestry, the call of the sea is in the blood and it is to the sea we turn for our completest holiday.

One of the greatest recreational assets of the Nation is the New England coast. The health and happiness it brings each summer to an unnumbered multitude are vital elements in our national well-being and of infinite value. Every year that multitude increases, as towns and cities grow and transportation becomes easier.

The coast is limited, and its western portion, from New York to Portland, is already crowded in the summer period. Its eastern portion, from Portland to the Canadian boundary and the Maritime Provinces, is wilder, more picturesque, and of far greater actual length, owing to the way in which the sea penetrates it in great arms and reaches.

At its center from Penobscot Bay to Frenchman's Bay, the two most beautiful sheets of water on our eastern shore, there is an archipelago of islands and rocky islets, great and small, and the greatest of these, domi-

nating the coast for forty miles with its mountainous uplift, is the Island of Mount Desert, whereon the National Park is placed.

Discovered by Champlain in 1604, Mount Desert Island belonged for a century to the Crown of France as a portion of Acadia; then passed to England by the right of conquest and presently to Massachusetts, the Province first and then the Commonwealth, of which Maine was a part until a century ago. Settled by lumbermen and fishermen, resort to it began in the middle of last century, when the establishment of the Boston and Bangor steamship line first gave access to it. On it, alone, on our Atlantic coast, mountains meet the sea, fronting it in a splendid, baretopped granite range—Champlain's Monts deserts—that was a noted landmark to mariners in old sailing days.

Lakes lie among the mountains, deep and clear and forested to the water's edge; and at the Island's midst the range is penetrated by a glacial fiord—Somes Sound—whose passage through the mountains is magnificent.

These mountains form the nucleus of the National Park. Two hundred miles of trails lead over them, marked with cairns, affording views of land and ocean to a far horizon that for sheer beauty and inspiring quality are in their kind without an equal.



LAFAYETTE NATIONAL PARK, MAINE

Stepping stones across the outflow from the Tarn, an ice-eroded lake basin at the foot of Champlain Mountain in the most eastern of our National Parks.

The National Park Office is at Bar Harbor, on the shore of Frenchman's Bay. A dozen miles away, a steel and concrete drawbridge, lately built, connects the Island at the Narrows with the mainland and State highway system, over which two principal routes are marked for motorists from Portland to Bar Harbor and the National Park—the one along the coast, with its old seaport towns; the other, by the Kennebec and the State Capital at Augusta.

Coming by rail, the journey ends in a swift ferry to Bar Harbor across Frenchman's Bay, facing the mountains and protected by a range of rocky islets from the open sea—in favorable weather a superb approach.

Mount Desert and its resorts have long been famous, and the travel to them Nation-wide; Lafayette National Park, a gift to the Nation for the people's benefit, is still in its beginning, but it is rich in beauty by the gift of Nature and rich in opportunity for the future.

YELLOWSTONE NATIONAL PARK

By Horace M. Albright, Superintendent

THIS is Yellowstone National Park's Golden Anniversary year. Fifty years ago, March 1st, it was established by Congress "for the benefit and enjoyment of the people." A pioneer Montanan, Judge Cornelius Hedges, in seeking a way to preserve the wonders and beauties of the Yellowstone region, gave to the nations of the Earth the National Park idea, and today the idea is a conservation principle of first importance

in many countries. Thus, Yellowstone Park in 1922, as it celebrates its semi-centennial anniversary, deserves to have the intelligent and progressive people of the world consider in their moments of reflection on civic affairs, what this great playground, and the altruistic idea upon which it is founded, means to them and to posterity.

There will be tens of thousands of visitors to Yel-

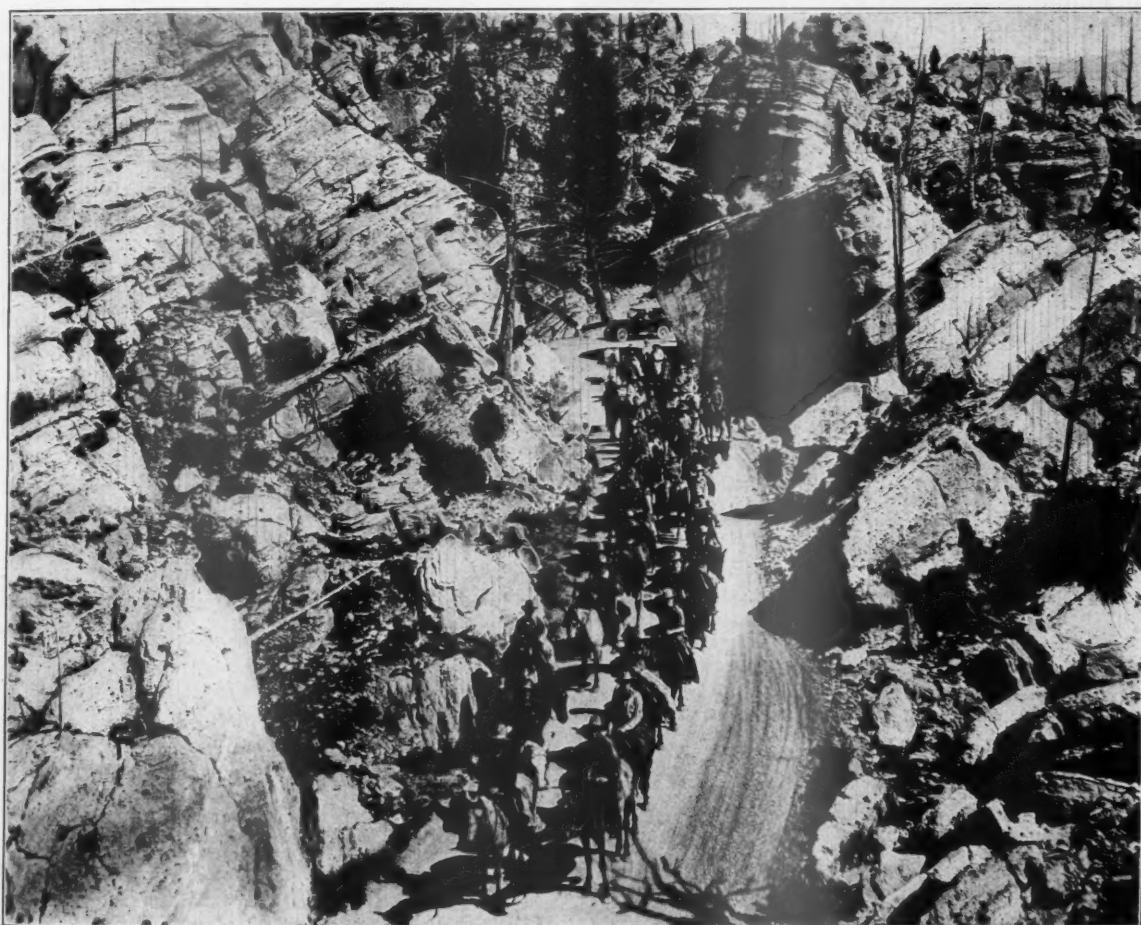
lowstone National Park this year, coming by rail or by automobile, planning to use their own equipment and camp out in the forests, or to tarry a while at the hotels or permanent camps. Never has the great Park been better prepared to receive its friends. Its three hundred miles of road are in excellent condition, there are more and better trails than ever before—a thousand miles of them, the public camp grounds have been extensively improved, the permanent camps have largely augmented their facilities, and likewise the hotels are equipped to accommodate more guests than at any time in the past. Railroad rates are very reasonable this year.

Plan a horseback tour of the Yellowstone and see the wild life at close range, the buffalo, elk, deer, antelope, moose and beaver; go into the recently explored "Cascade Corner" of the Park, or to Grasshopper Glacier where millions of grasshoppers of ancient species lie imbedded in a body of ice of enormous proportions; or ride to the moose country at the headwaters of the Yellowstone. Saddle horses and guides are available in the Park or at nearby "dude ranches."

For the fisherman, the Yellowstone offers great sport. Here the native cutthroat trout abounds, also the native grayling, but Brook, Rainbow, Loch Leven, Mackinaw and other trouts planted in Yellowstone waters also furnish snappy recreation for the angler.

From the standpoint of opportunities to study Nature's handiwork, the Yellowstone has no equal or close competitor. Geysers, hot spring terraces, the Grand Canyon, petrified forests, lakes, rivers, waterfalls, unbroken forest wilderness, wild animals, 202 varieties of birds, exquisite wild flower displays, glaciated valleys and lava flows, are all easily accessible. Here Nature is still working vigorously while exhibiting a wide range of wonderful achievements. The Park has a museum, a lecturer on its history and natural features, and nature guides to explain in popular language the meaning of the phenomena that are to be observed on every hand.

Whether one visits Yellowstone National Park to find seclusion in the fastness of our last great wilderness, or to ride horseback over its thrilling trails, or to study



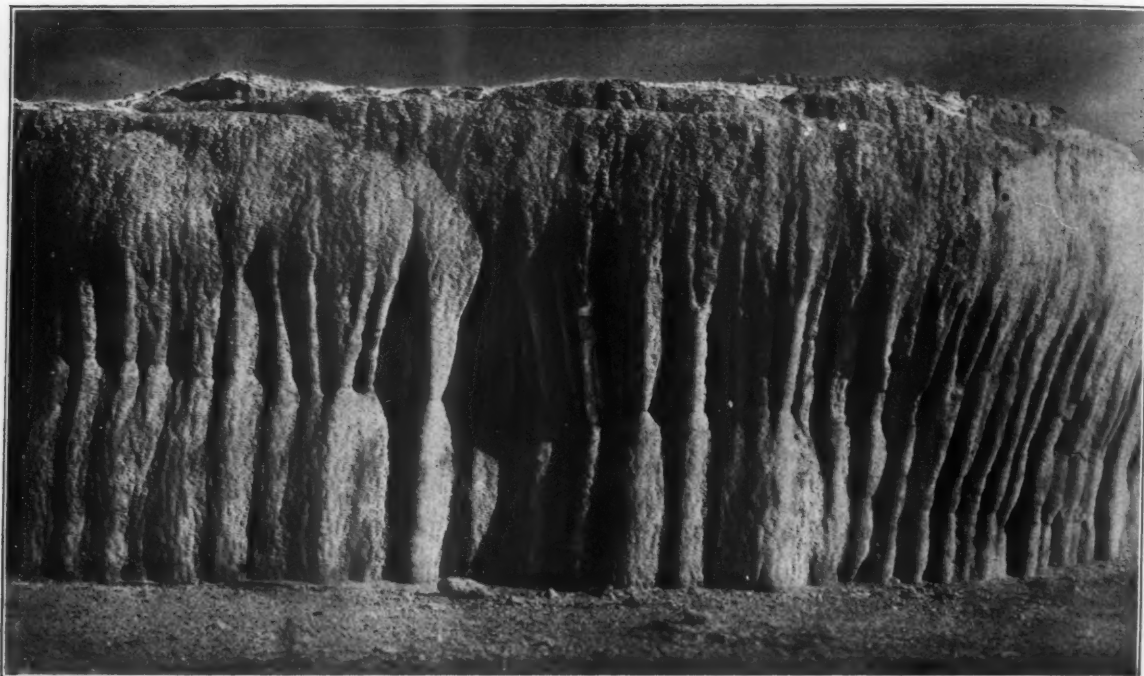
Photograph copyrighted by Haynes, St. Paul

HORSEBACK PARTY IN THE HOODOOS, NEAR MAMMOTH HOT SPRINGS

A horseback tour of the Yellowstone National Park, with its high, dry, pine-laden air will pay big dividends in improved health, appetite and sleep. The mecca of many summer excursionists.

its exhibits of natural history, or to fish its crystal clear waters, or to motor over its scenic roads, or simply to rest in the peaceful atmosphere of the high mountains,

he may be sure that in our oldest and largest Park he may find all that he has hoped for, and more thrown in for good measure.



TERRACE AT MAMMOTH HOT SPRINGS

Beautiful yet fantastic terrace built up by deposits of lime from the marvelously colored hot springs at this point. One of the most novel scenic effects in the world.

YOSEMITE NATIONAL PARK

By W. B. Lewis, Superintendent

YOSEMITE Valley is familiar to most citizens of the United States at least by picture if not by personal visit. Never a month passes but that one sees in several magazines photographs of El Capitan or Half Dome, and Vernal, Nevada and Yosemite Falls are as well known to Easterners as to native Californians. Yosemite Valley, however, is but a small part of Yosemite National Park.

With the passing of the stage coach has come the influx of hordes of visitors, and the Valley has lost much of its former romantic and dreamy atmosphere. A few lovers of the Old Yosemite deplore the so-called "popularization" of the Valley—the admission of automobiles. The opening of roads to privately owned machines merely means that thousands are enjoying Yosemite who could not have done so under the old conditions and that the frontier has moved farther back.

Leave the Floor of Yosemite Valley and you are in the wilderness; there are a thousand square miles of wild, High Sierra country in the Park. It is this virgin highland region, much of it almost unexplored, that is now calling hundreds of the more adventuresome tourists to the trails of the back country.

There are many ways of seeing the High Sierra, some of them costly but with all the comforts one could desire and others requiring more physical exertion but less of a money outlay than for an equal period at home. A recently developed and most convenient means of seeing the upper regions is for one to make his headquarters at the chalets or lodges that are maintained in the heart of the mountains. These are but one or two days by foot or horseback from Yosemite Valley and serve as excellent bases from which to explore the neighboring regions. But by camping out one is free to roam the trails of the Big Country at will, stopping as his fancy wills beside a trout stream or climbing to sandy timberline benches on glacier-polished heights. A camping outfit, guide, packers, cook, and pack animals may be hired in Yosemite for trips to any part of the Park. This offers the maximum degree of comfort and the minimum of worry and responsibility; for the majority of visitors, however, it is too expensive.

The trails of the Park are becoming so well marked that a guide and packer are not necessary, and even the most inexperienced of mountaineers need have no fear of pioneering in the back country.



CATHEDRAL PEAK

Photograph by Ansel E. Adams

Where the sunrise trail crosses the divide it passes one of the many fine fishing lakes in Yosemite National Park and fishing is one of the attractions to many of the visitors.

Hundreds of persons are now climbing eastward to peaks and canyons that were known but a few years ago only to members of the Sierra Club and a few other mountaineers. It is gratifying to the few of us who administer this vast playground of the people to ride through the High Sierra and find how many persons

have discovered the charm of "The Home of the Red Gods." Some of them are knapsacking; others walking beside the burro or mule that bears their burdens; many riding and leading a pack train; and a few following packers and guides with all the appurtenances of a "dude" outfit. All are happy.

GRAND CANYON NATIONAL PARK

By W. W. Crosby, Superintendent

EVERY American, at least, should make as soon after maturity as possible, for his benefit as a citizen and as an individual, two pilgrimages—one to Washington's home at Mount Vernon, Virginia, and the other to the Grand Canyon of Arizona. Sentimental journeys they must be; the first to the place most closely associated with our Nation's greatest hero; the second to Nature's greatest wonder.

Grand Canyon National Park is not a "playground" in the same sense that the term is applied to many other Parks. There are ample facilities for amusement or recreation, but the Canyon belittles them all.

Its infinite magnitude, majesty, coloration, and fascination, so affect its visitors that indelible impressions are left in the minds of all as to the incomparability of the Canyon with any other natural or artificial wonders of the world.

Several other localities have their wonder-units of scenery. The catastrophe of the destruction of any one of them would be mitigated by the fact that there still would remain elsewhere similar scenery, though one might have to journey farther to see it. But to lose the Grand Canyon would mean the annihilation of something that can not be found elsewhere on earth.

To every visitor it is something different from anything else, something unheard, unread and unimagined. Even the single experience of watching from the rim the immense kaleidoscope presented daily in the rays of the sun on his journey over and along the length of it—to say nothing of the motor trips along the rim roads or the muleback trips down into its depths—leaves impressions which will be carried in the mind through all other experiences of life-time.

The Grand Canyon is an ideal place for the intelli-



Photograph copyrighted by Fred Harvey Company
ACROSS THE COLORADO RIVER IN THE GRANITE
GORGE

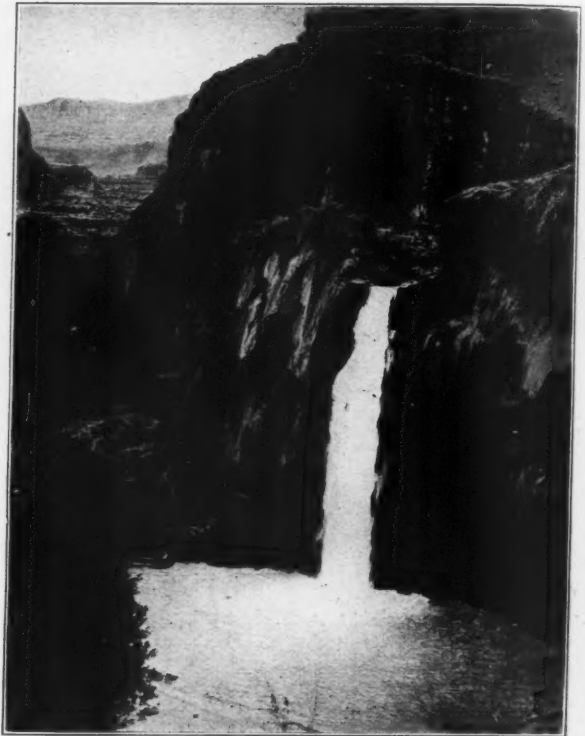
View taken from the mouth of Bright Angel Creek near where is located the new Phantom Ranch. At the lower end of the left-hand gully, in the shadow, may be seen the trail beginning to zigzag its way up to the Tonto Plateau, 1,500 feet above the river.

gent person to spend a vacation. The trails are always open, and, even when the snow does lie on the rim, some motor trips may be made for the views. Foot, saddle-horse, and muleback trips into the Canyon always offer the enjoyment of glorious scenery, inspiring surroundings, and novel situations under comfortable circumstances.

The climate as a whole is unexcelled. In the winter there are but few days when it is disagreeable to be outdoors even on the rim. If necessary, by shifting one's abiding place (from the rim to the unique Fred Harvey Ranch at the mouth of Bright Angel Creek down in the river gorge—4,500 feet lower than the rim—for instance) one can bask in the sunshine (of Palm Beach or of Coronado) and contemplate in comfort the snows

of Quebec above. In midsummer the temperature on the rim seldom exceeds 85 degrees F. The moisture content of the air is so low that the "sensible" temperature seems much less than this figure among the big pines, the cedars, and pinons which cover the rim.

The Grand Canyon National Park is in the heart of our southwest wonderland. The reservations of a "Vanishing Race" the Hopi, Supai, Navajo and other Indian tribes may be visited from it. "Cliff Dwellers" ruins are



Photograph copyrighted by Fred Harvey Company
HAVASU FALLS IN THE CANYON OF THAT NAME

It drops over a background wall plastered with dark red travertine festoons and is one of the most picturesque waterfalls in the parks. Havasu is the Indian name for Sky Blue Waters.

found in the Park itself and the ancient pictographs of a forgotten race, in and nearby the Park, await translation. The Petrified Forest National Monument may be easily reached from here by automobile and by train.

There is, in Grand Canyon National Park, at least one natural invitation for every American to visit it. For a multitude there are several forms of this invitation.

GLACIER NATIONAL PARK

By J. R. Eakin, Superintendent

GLACIER National Park, with its 60 glaciers, 250 lakes and hundreds of waterfalls, serrated peaks and sheer precipices, contains the noblest mountain scenery in America. Here one may ride in an automo-

bile, a launch, ride horseback and visit a glacier all in one day and never be more than a few miles from a modern luxurious hotel. Or one may climb to the very crest of the Continental Divide and spend the night at a com-

fortable chalet, amidst scenery that beggars description, and view a sunrise and sunset that only Nature could paint.

Glacier's maximum north and south dimension is about 50 miles and its maximum east and west dimension is about 40 miles. Within the boundary of the park is located the intersection of the north and south and east and west continental divides. At the junction of these divides is Triple Divide Peak and from its summit one can toss a pebble into streams flowing into the Hudson Bay, the Gulf of Mexico and into the Pacific Ocean. This is a distinction that no other section of North America can claim.

It is doubtful if any other area contains so much of interest to scientists and naturalists. Due to the Lewis Overthrust, incredible as it may seem, in many localities the younger rocks are found on top, in the reverse order that Nature formed them. Glacier National Park is the one place where the flowers of the Pacific Coast, the Alaska Region, the Northern Plains and the Rocky Mountain Region meet. Another feature that lends variety is the contrast between the relative humidity of the west slopes of the Continental Divide and the aridity of the east slopes. Consequently, no other area has such a great variety of flowers, trees and shrubs.

Several of the National Parks attract more visitors annually than Glacier, yet if actual tourist days were considered Glacier would rank with the leaders. Its

charm is proven by the thousands who return year after year for visits of increasing length.

More saddle horses are used at Glacier than all other Parks combined. The road system is at present undeveloped though most points of interest in the valleys can be reached by automobile, and good camping grounds are provided. The Trans-mountain Road now under construction, when completed, will be by far the most scenic highway in America, if not in the world. The trail system comprises 669 miles, of which 371 miles are classed as tourist trails, the remainder being boundary and fire trails. Tourist trails cross the Continental Divide in five places. In addition, seven other divides, practically as high and as interesting are crossed.

Signs are distributed along tourist trails in such a manner that pedestrians cannot get lost. It is believed that no other section of the country contains such interest for rugged hikers. Walking tours of the Park are rapidly increasing in popularity.

Through an arrangement with the University of Montana the Free Nature Guide Service conducts short daily walks, during which flowers, trees, animals and other things of interest are pointed out and explained, and popular talks will be given in the evenings at principal tourist centers on the flora, fauna and geology of the Park.

Fishing is excellent and visitors should bring fishing tackle. The principal varieties of fish are Cutthroat, Dolly Varden, Rainbow and Eastern Brook Trout.



AFTER THE STORM

Photograph by R. E. Marble

Lake McDonald on the west side of the Continental Divide is Glacier's largest lake. Nine and one-half miles long by a mile wide it is fringed with magnificent forests.



LAKE McDONALD, GLACIER NATIONAL PARK

Photograph by R. E. Marble

The new Transmountain Highway will cross the Continental Divide through Logan Pass to connect Glacier's east and west side road systems. The section along the east shore of Lake McDonald is open to automobile travel.

MESA VERDE NATIONAL PARK

By Jesse L. Nusbaum, Superintendent

A MERICAN tourists by the hundred thousand yearly spend millions of dollars in visiting foreign lands and viewing the achievements of civilizations long since past or decadent, a few thousand only are sufficiently interested in their own pre-Columbian America to investigate the archaeological wonderland of the Southwest.



FAR VIEW HOUSE

Photograph by George L. Beam

This mesa pueblo, one of the Mummy Lake group of ruins, was excavated in 1916 by Dr. J. Walter Fewkes, chief of the bureau of American Ethnology. Dr. Fewkes' campfire talks in the park are looked forward to each year by visitors.

Mesa Verde (Green table or table-land, named from the dense forest of pinyon and juniper cedar covering it) was made a National Park in 1906, in order that the finest, largest and best-preserved cliff-dwellings in this country, if not in the world, "might be protected and preserved for the enlightenment and education of the present and future generations."

This great detached table-land, rising boldly and abruptly from one thousand to twenty-five hundred feet above the valleys surrounding it, and, undoubtedly, commanding the greatest expanse of mountain, valley, plain and desert country to be seen from any accessible point in the Southwest, was further protected by many deep, narrow, parallel canyons heading at the north rim, and separated by small tongue-like mesas.

iously arranged under the protecting roof of the cave, that it means that not a single foot of usable space was wasted, and so well constructed by the cliff-dweller masons that structures of four stories in height still remain nearly intact. Deserted centuries ago, for what reason no one can say, they stand today the finest examples extant of primitive architecture in this country.

Far View House, the only excavated unit in the Mummy Lake group of sixteen great mounds, occupying level ground on the Chapin Mesa, presents a totally different or "unit type of pueblo construction," large living rooms surrounded by the kivas, and forming a compact, rectangular shaped building.

This is a later development of the cliff-dwelling culture, whereas Earth Lodge A, a pit dwelling of a semi-subterranean type, near Square Tower House, shows



Photograph by George L. Beam

This ruin, excavated in 1920, was devoted to fire worship by the cliff dwellers. It is a connecting link between the people of the mystic past and the present. Dr. Fewkes is the figure in the photograph.

Great caves in the vertical side-walls of the smaller canyons offered a maximum of natural protection, both from enemies and the elements, and ideal home-sites and storage spaces adjacent to the rich, red soil of the mesas above, to these peaceful, home-loving agriculturists.

Because of their thrift and foresight in storing away corn and other vegetable products to carry them over years of periodic drought and crop failure, they were constantly subject to raids of the non-agriculturist Indians, who depended largely upon game for subsistence. The many ruins and circular watch-towers, which dot the mesa at points of vantage, indicate the seriousness of these raids.

Cliff and cave ruins are found, literally, by the hundred within the Park area, ranging from the small one-room, apparently inaccessible ruins to a great communal development as represented by Cliff Palace with over two hundred secular rooms and twenty-three circular, subterranean kivas, or ceremonial rooms, so ingen-

the earliest type of home so far found on Mesa Verde. In every direction, over the mesa top, mounds, indicating either great settlements or isolated rooms, are found, awaiting the investigation of scientific men, who alone are permitted to conduct excavations, and then only for the benefit of reputable museums or scientific societies. The wanton destruction of archaeological sites, at the hands of the commercial pot-hunter, is now a thing of the past.

Protective measures are intimately associated with the problem of excavation in this Park in order that exposed ruins may last indefinitely, and to Dr. J. Walter Fewkes, Chief of the Bureau of American Ethnology, of the Smithsonian Institution, under whom all the work has been accomplished with the single exception of Balcony House (the work of the author), belongs the credit of making Mesa Verde live again in the light of the past. His evening camp-fire talks explain the problems of the day.

THE SEQUOIA NATIONAL PARK

By John R. White, Superintendent

STUDENTS of any subject are always intensely interested in the finest examples to be found in their particular line of work. The architect dreams of the day when he can see the Parthenon or the Taj Mahal; the volcano-

It is conceded by dendrologists and travelers that the forests of this Park surpass any other of their kind in the size and beauty of trees and in the number of species represented. As well as the Big Trees, almost limitless in number, size and age, there are not less than 10 species of pine, two of true firs, the cedar, and the so-called nutmeg, 6 species of oak, 2 each of alder, cherry, maple and dogwood, and many others.

Another feature which commends this Park to the forest lover is the possibility of reaching the Big Trees at any season of the year. Only in the region of the Sequoia National Park is it possible to actually see the



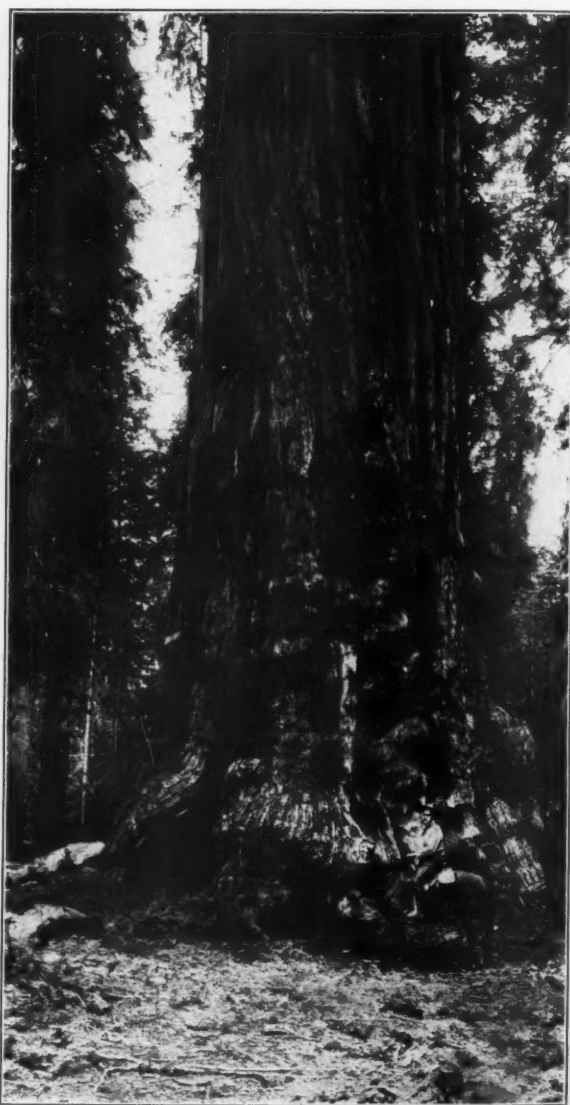
Photograph by George F. Belden

THE PILLARS OF HERCULES

The Giant Forest, Sequoia National Park, contains in an area of 3,200 acres 5,000 sequoia trees, over 400 of which exceed 10 feet in diameter. The General Sherman Tree, 36.5 feet in diameter, is the largest and oldest living thing in the world.

logist turns his steps toward Vesuvius or Mauna Loa; the lover of waterfalls seeks the Yosemite; the big game hunter goes to East Africa or the Canadian Rockies.

The forester, or even he who merely loves trees, follows therefore a natural instinct when he turns longingly towards the Sequoia National Park for it is there that the mightiest forest in the world has been preserved; it is in that Park that the largest trees in the world are to be found. *Sequoia gigantea* or *Washingtoniana* is best studied at Giant Forest where the Big Tree of California is found not only in many groves but in true forest growth. Elsewhere in California the Big Trees occur in isolated groves as at Calaveras, Mariposa and Tuolumne. But in the Sequoia National Park they are spread over many miles so that the forest lover may wander among them and find mammoth trees rarely if ever visited and may study them "far from the maddening crowd."



Photograph by George F. Belden

THE "ABE" LINCOLN TREE

Height, 270 feet; diameter, 31 feet. The Sequoia tree is the crowning achievement of the vegetable kingdom in size and majesty and age.

Big Trees from the valley, thousands of feet below them. At Three Rivers one may sit on the porch of a ranch house at an elevation of some 900 feet, surrounded by citrus trees and the flowers of the lowlands, and gaze at the skyline of the Giant Forest plateau, 6000 feet above and 9 or 10 miles air line distant. On that skyline, thrusting their heads above the lesser trees, the sugar pines, the yellow pines and the silver firs may be seen the Mammoth Trees. With a field glass it is even possible from Three Rivers to distinguish individual sequoias on the rim of the plateau between Moro Rock and Hanging Rock.

A new road is now being constructed by the National Park Service up the warm south slopes which lead to the Giant Forest plateau from the Middle Fork of the Kaweah River. When, in about a year's time, this road is completed it will be possible to motor from the valley to the Big Trees at any season of the year. Meanwhile they are accessible by automobile from May to October

by the Giant Forest Road, a mountain road better than the average. And during the winter they may be reached by automobile to Hospital Rock and thence by an 8-mile trail into Giant Forest.

About 30,000 visitors have annually entered the Sequoia National Park during the past two or three years. The number increases each year and this practically without advertising. Each visitor has gone away as a living advertisement to the attractions of this region; to its accessibility; its delightful camping places among the Big Trees and to its excellent fishing in streams and lakes.

But it is, after all, the true lover of trees who here finds complete contentment; who finds in the forests of the Sequoia National Park the supreme examples of nature's architecture and who year after year, in increasing numbers comes to the well named Giant Forest to wonder and compare, to enjoy that uplifting thrill which the Mammoth Trees can give, to turn away with reluctance and to count the days until he may again return.

CRATER LAKE NATIONAL PARK

By Alex Sparrow, Superintendent

THE principal attraction of this National Park, as its name suggests, is a lake. This may sound disappointing, but Crater Lake has never disappointed. Imagine standing on the edge of a giant bowl six miles in diameter and looking down a thousand feet on a body of water of the deepest Prussian blue and you have gained some conception of Crater Lake.

And when you have actually stood on the rim of its crater and have gazed down into its fascinating depths then if you are not overwhelmed with the sense of your own puny insignificance, your journey will have been in vain. But Crater Lake has never failed to exercise its spell.

Congressman Sinnott in describing Crater Lake in the House of Representatives in 1918 said:

*"To the scientists, a mighty volcano collapsed within itself
Mount Mazama, 15,000 feet high, telescoped.*

*"To the poet, 'the sea of sapphire,' 'the sea of silence,'
'a lake of mystery.'"*

"To me, a shell hole of a war of worlds—who knows?"

*"Could the great blind poet have seen this marvel ere his
pen had Lucifer and his host of rebel angels—*

Hurled headlong flaming from the ethereal sky,

With hideous ruin and combustion down—in Miltonic imagery here he'd have found the impact."

Now if you have come this far you are about ready to ask—where is Crater Lake? It is in southern Oregon in the very heart of the Cascade Range at about 7,000 feet above the level of the sea. It is reached by auto stage from either Medford or Klamath Falls, Oregon, stations on the Southern Pacific Railroad. Any ticket agent will tell you how to get here. If you drive the family "Flivver" or a Packard Twin Six the way is just as easy and

the Oregon tourist and Information Bureau, Portland, Oregon, will send you a road map if you will but write.



Photograph copyrighted by Scenic American Company
BLUEST OF BLUE WATERS, CRATER LAKE, OREGON

There are crater lakes in other lands, but the one lake of its kind in the United States exceeds all others in beauty and in magnificence of setting.

There is comfortable lodge on the rim and free public camp grounds for the camper. An automobile road, 35 miles in length, completely encircles the rim. There is an easy trail to the lakeside and launches for the ride around

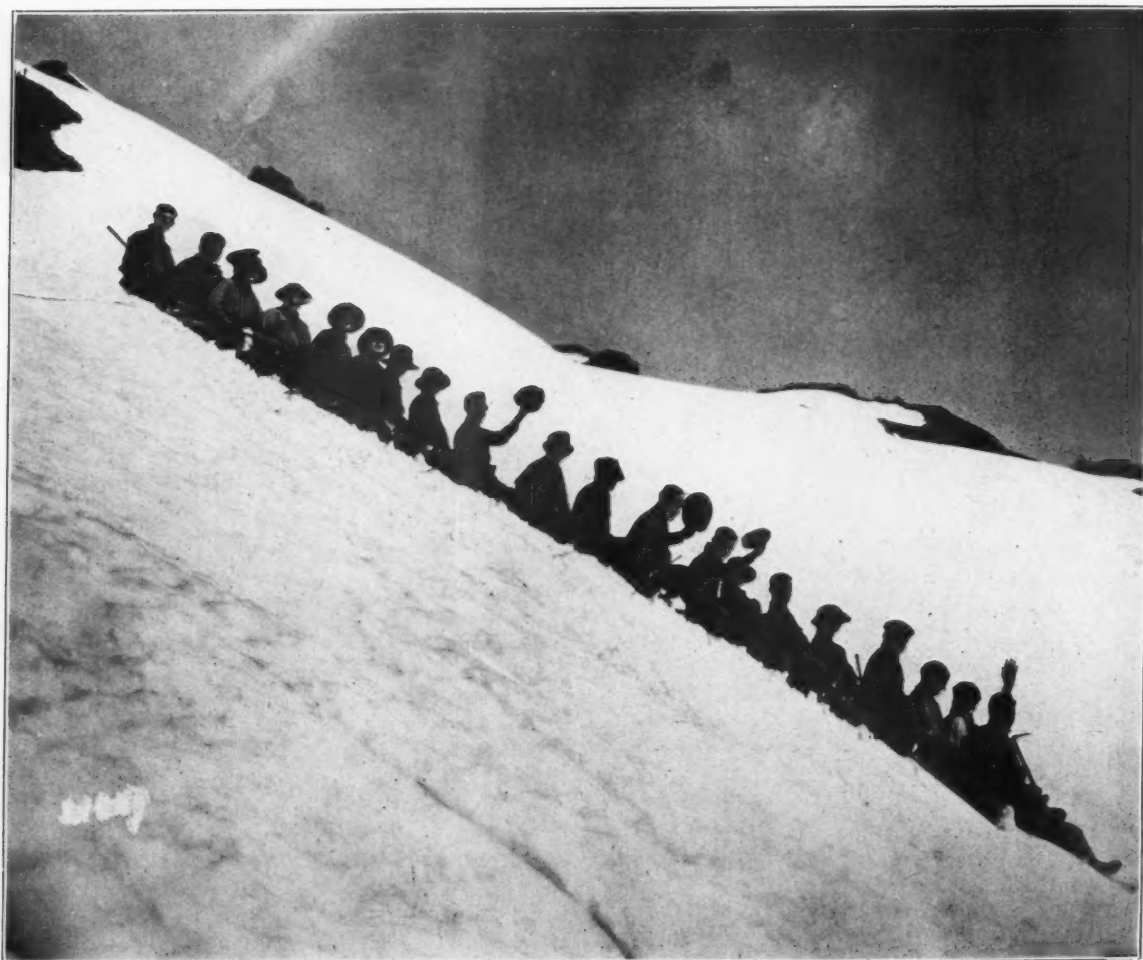
the lake. There are rowboats for the fishermen, and that reminds me, don't forget to bring along your rod and tackle for Crater Lake's trout are as gamey as they are delectable.

MOUNT RAINIER NATIONAL PARK

By W. H. Peters, Superintendent

MOUNT Rainier National Park is the greatest single attraction in the Pacific Northwest. The principal features that entitle Rainier to its place of distinction are its virgin forests, its variety of beautiful wild

and 6 miles long and vie in magnitude and in splendor with the most boasted glaciers of the Alps. Cascading from the summit in all directions, they radiate like the arms of a giant octopus.



A HUMAN TOBOGGAN

Photograph by Frank Jacobs

"Nature sliding" on the snow slopes below the glaciers in Paradise Valley. Winter sports in the summer may be indulged in by the visitor to Mount Rainier National Park.

flowers, its mighty system of glaciers, and last but not least the mountain itself. This massive peak after which the Park is named looms 14,408 feet above sea level and 10,000 feet above its immediate base. The total area of its glaciers amounts to no less than 48 square miles, comprising 28 glaciers, many of which are between 4

The National Park is a place of diversified attractions. One can come prepared to stay a day, a week, or a month, and find new interest for every day. Situated only 56 and 96 miles, respectively, from Tacoma and Seattle, it can readily be reached in a few hours by automobile or train. One can breakfast in Seattle or

Tacoma and lunch among the flowers and glaciers in the Park.

At Longmire Springs the visitor gets his first real "close-up" of Washington's wonderful inheritance—Mount Rainier. Snow-clad, gleaming bright, and over-looking like a mighty monarch of ancient Rome, all the dark heavily forested hills and valleys surrounding it, it is to the beholder an awe-inspiring spectacle. One never tires looking at it. But whenever the eye chances to stray from its mighty snow and ice-covered dome there may be seen other attractions in and around Longmire Springs, the first stopping place in the Park. Here the comfortable National Park Inn is located. The hotel and camp accommodations are strictly modern, efficient, and conducive to the comfort and enjoyment of the visitor. Each year added improvements make Longmire Springs more desirable as a place to stay rather than just a stop-over. From here radiate several of the trails and footpaths to the many interesting sections of the Park on the southwest side of the mountain. Directly in front of National Park Inn is a large open area, grass covered, and containing many interesting and health-

giving mineral springs, chief among them being sulphur, iron and soda.

Leaving Longmire Springs the visitor starts on the final lap of his journey to Paradise Valley, which is nestled at the foot of the great mountain, surrounded on all sides by precipitous peaks. The highway to Paradise is unsurpassed in beauty and thrills, for on this stretch of the road the traveler ascends from an altitude of 2,761 feet to 5,557 feet. At the journey's end (for everybody goes to Paradise Valley) a beautiful scene is presented. Here, standing on the lovely veranda of the homelike Paradise Inn, one can see in every direction myriads of gorgeous mountain flowers, in every hue and color. And the flowers grow to the very edges of the mountain's glaciers.

Paradise Inn is the starting point for the strenuous Summit Climb and the delightful Sky Line Trail saddle horse trip. Skiing, tobogganing, and various other snow sports are indulged in in Paradise Valley all summer long. In short everything to contribute to an exceedingly interesting, health-giving and wonder-filled trip is to be found in Rainier National Park.

THE HEART OF THE ROCKIES

By Roger W. Toll

Superintendent, Rocky Mountain National Park

THE Rocky Mountain National Park was created in 1915, and includes within its boundary lines a region that is typical of the best of Colorado mountain scenery. The park has an area of 397½ square miles, or a quarter of a million acres.

The Park encloses about 29 miles of the Continental Divide and has 46 peaks of an elevation of 11,000 feet or more. The highest of all is Longs Peak, whose elevation is 14,255 feet. More than a thousand people climbed this peak last summer.

Rocky Mountain National Park is 75 miles from Denver, by good automobile roads. There are several approach roads and all of them are scenic though different in character. Because of its accessibility, Rocky Mountain National Park draws many visitors, who come from the central and eastern states to escape the hot weather, and to spend their vacation in healthful and bracing outdoor exercise. One may ride horseback, fish, climb mountains and be as strenuous as possible, or one may rest at any of the thirty hotels in the neighborhood, and play golf or tennis.

During the ice age, great glaciers streamed down the valleys from both sides of the Continental Divide. These glaciers have now disappeared, except for small ice fields at heads of the valleys, but the work that they did in scooping out valleys, building up moraines, and gouging out glacial cirques, is still plainly visible and adds much interest to the landscape.

The Fall River Road has recently been completed between Estes Park and Grand Lake. This crosses the Continental Divide, and reaches an altitude of 11,797 feet above sea level. Part of the road is above timber-



Photograph by Frank W. Byerly

LAKE HAIYABA—LONG'S PEAK IN THE DISTANCE

Nestled close under the Continental Divide this beautiful lake is easily reached by hikers from the valley hotels and camps.

line, and offers the visitor a wonderful panorama, with the great plains on the east, and range after range of snow dotted mountains in other directions. The snow lies deep on this road, but is opened as soon as possible after June 15, and the early visitor drives past drifts of snow in places higher than his automobile.

The circle trip from Denver to Estes Park, then over the Fall River Road to Grand Lake, and then recrossing

the Continental Divide at Berthoud Pass, and returning to Denver by way of the Denver Mountain Parks, makes a remarkably fine automobile trip. This trip is 235 miles in length and can be made in two days, but one should allow at least a week for the trip in order to stop for a few days in Estes Park, and again in Grand Lake. This gives time to enjoy the beauties of the park, instead of hurrying past them.

DR. JOSEPH TRIMBLE ROTHROCK DEAD

DR. JOSEPH TRIMBLE ROTHROCK, of Pennsylvania, a vice president of the American Forestry Association and one of the most noted foresters in America, died on June 2, aged 84 years. Dr. Rothrock was known as the "Father of Pennsylvania Forestry." For many years he devoted himself to advocating and practicing forestry in his state and secured many beneficial forestry laws. A short time ago he resigned after many years' service as a member of the Board of Forestry Commissioners. He had served the state in other positions and was considered one of the leaders in botany, not only in the United States, but in Canada and other countries. He wrote many books and magazine articles on botany, having made researches and explorations.

He was educated at Freeland Seminary, Montgomery County, and the University of Pennsylvania, graduating from the Medical Department of the latter institution after his return from service in the Civil War. In the war he served as a member of Company E, Twentieth Cavalry, participating in many battles. He was badly wounded in the battle of Fredericksburg.

After graduating from the University he was made professor of botany in that institution. He had also graduated from the Lawrence Scientific School at Harvard University in 1864. He remained at the University of Pennsylvania until 1868, afterward conducting the North Mountain School of Physical Culture and was lecturer for the American Philosophical Society.

Under the direction of the United States Government he led an expedition to explore British Columbia. He was afterwards appointed botanist of the United States Geological Survey.

He was noted as a big game hunter and made annual trips into the wilds of Canada. On his last trip, last autumn, he killed five deer and a caribou.

Dr. Rothrock was noted as the inventor of pemmican, a food composed of beef and apples which grew in great favor with explorers in the frigid country and was claimed to be a preventive of many diseases, including scurvy, the most fatal ailment facing the Arctic explorer or hunters.

Dr. Rothrock's most known work on botany was "Medical Botany of North America," a work which is considered an authority on many matters. He was a mem-

ber of McCall Post, G. A. R.; Chester County Historical Society, American Philosophical Society, Philadelphia Academy of Natural Sciences, Society of Naturalists of United States, Canada Botanical Society, Academy of Political and Social Science, Pennsylvania Historical Society, National Geographic Society, the Masonic Lodge at McVeytown and the Pennsylvania State Forestry Association.

He was a life member and a vice president of the American Forestry Association. When his death was announced President Charles Lathrop Pack suggested to Governor Sproul, of Pennsylvania, the advisability of the state providing a large memorial forest for Dr. Rothrock, and in reply received the following letter:

"I am pleased to inform you that the State Forest Commission at my request considered at its meeting of June 12 your thoughtful suggestion that Pennsylvania set aside a memorial forest in honor of Dr. Joseph T. Rothrock. After earnest consideration, the Commission decided that the previous designation by it of a State Forest District comprising 474,880 acres of forest land, of which 33,187 acres is State Forest, is as lasting a forest memorial as could well be made to Dr. Rothrock. The Commission desires, however, and in this I fully concur, to do honor to Dr. Rothrock's memory in some substantial way, and it has appointed Col. Henry W. Shoemaker, of the Commission, to suggest the most fitting type of memorial. I might say that Col. Shoemaker is now considering a medallion in the Department of Forestry offices, a bust in the State Forest Academy, and a monument in the public square at McVeytown, the birthplace of Dr. Rothrock.

"Personally, and on behalf of the State Forest Commission, I wish to express my deep appreciation of the interest the American Forestry Association has taken in Dr. Rothrock and his work. Pennsylvania is exceedingly proud of him and his wonderful accomplishments.

"Sincerely yours,

"WM. C. SPROUL."

Dr. Rothrock attended forestry meetings whenever possible and was always an interesting and forceful speaker on forestry. His loss will be deeply regretted by forest conservationists.

ROADS OF REMEMBRANCE

By G. A. Whipple

THE American Expeditionary Forces received many impressions in Europe unrelated to war. One of the most permanent and important of such impressions was the striking beauty of French highways. Wherever the American doughboy traveled in France, and he traveled extensively by foot, army truck, and freight car, he almost always found the highways lined with trees—trees that adorned the landscape and added a pleasing diversity to the endless kilometers that spread their network over the land. The American brought back the picture of this feature of the French countryside and it will never fade from his mind.

Our soldiers learned that trees mean a great deal to Europeans, to the individual and the commonwealth, to the educated and the illiterate, the rich and the poor alike, that they are held universally in high economic and aesthetic regard by all the people. The Roads of Remembrance movement in this country is to a considerable extent, a reflection of this gratuitous education in the art of landscape improvement, of the American soldier in the world war.

A large proportion of the trees that flank the roads in France have been planted many years and for the most part are in full vigor and beauty of maturity. This system of landscape beautification is systematically maintained. Replacements are supplied from conveniently located nurseries. In some sections, even the crowns of the trees along the highways are artistically trimmed and in all cases the lower branches for a considerable distance up the trunk are cut off and utilized for firewood. This pruning permits a clear view of the surrounding country from every point as the traveler passes along the highway.

The Road of Remembrance as a memorial in this country is an idea well adapted to its purpose because along such roads the A. E. F. lived and worked and suffered the hardships of war. Moreover, the adoption of such an idea is a sincere compliment to the soil our warriors de-

fended, and to America's oldest and most honored friend among nations.

During the past two years there have been endeavors in various parts of the United States to build Roads of Remembrance. The movement received impetus in the West through the advocacy of the Chicago Tribune last year. In Louisiana a tree memorial along the Jefferson Highway is being promoted. Patriotic and civic bodies have given their moral endorsement and have offered material assistance from time to time. The Lincoln Highway Association is considering a trans-continental planting plan and numerous municipalities and civic organizations have made substantial plantings. The

American Forestry Association, under the leadership of Charles Lathrop Pack, started the Roads of Remembrance idea in 1919 and has encouraged it vigorously ever since, with the result that it is now evident that the thought has been so well planted that the coming years will find many of these memorial roads in every section of the country.

Probably the nearest approach to large, constructive and systematic planting has been achieved by the New York State

College of Forestry at Syracuse University. Prof. Henry R. Francis, landscape engineer and head of the Recreation Department at the college, has surveyed and carefully mapped the main automobile route between Syracuse and Utica. The survey was finished two years ago as part of a contemplated plan to line this main artery of travel between New York and Buffalo with trees.

It would be a great mistake to attempt such an improvement unless it is done properly. According to the best scientific opinion the work involves an accurate study of soil conditions, topography of the country, obstructions, and a due regard for the rights and desires of the owners of property along the route. In fact, it is impossible to put down in black and white any hard and



Photograph by A. R. Shattuck

TYPE OF ROAD OF REMEMBRANCE

This fine road, shaded by noble poplars, indicates the kind of Road of Remembrance along which trees may be dedicated to the memory of soldiers of a large community. Such plantings are being made in many sections.



Photograph by A. R. Shattuck

CURVES NOT OBSCURED BY TREES

By this style of planting along Roads of Remembrance the view may be kept as clear and open as it is on a stretch of straight highway.

fast rule of treatment that would apply to all these various conditions which will have to be met as they occur.

It was ascertained that on every highway there are many trees already in varying stages of growth and decline that would have to be considered, that some soils would accept one kind of tree and another soil demand a different kind, that telephone wires, curves in the roadway, embankments and swampy sections present their individual problems. Views of striking beauty should by no means be obscured. The question, too, of tree enemies—diseases and destructive insects—require the attention of specialists, as the subject relates to the variety of localities along the route. The Road of Remembrance, therefore, is no simple development that can be called into being by a trick of magic. It will entail time and labor on the part of a competent staff if it receives what it deserves, the best possible treatment.

Practically every organized agency in New York State that would be at all interested in the project is in favor of the Road of Remembrance, if anything can be judged by the letters received from the officials of such agencies. Moreover, the public through the pulpit and the press has voiced its approval. This universal desire to see the Roads of Remembrance become an actuality is due largely

to the following reasons: The first is the increased value that would accrue to property by the planting of trees.

Second—There is a growing conviction in the United States that this nation is old enough to eradicate the traces of primitive crudeness and ugliness emphasized in the appearance of our highways, that it is time our country partook of the same beauty and charm that is so evident along the roads of Europe. We make our homes attractive, but not our highways.

Third—The inspiration to make of this landscape improvement a memorial to the soldiers who responded to the call of the country in the country's hour of need. This really is the moving spirit. The feeling that the unstinted service of our soldiers and their great sacrifice cannot be recalled too frequently and that the expression of gratitude of the people can in no other way be more popularly and handsomely embodied than by establishing these living monuments to sanctify their memory has found lodgment in the hearts of the people.

Last November representatives of the New York State College of Forestry, the State Conservation Commission and the Commissioner of Highways of the State met at Albany and agreed to cooperate in the planting of the Road of Remembrance and this culminated in the



Photograph by A. R. Shattuck

MEMORIAL ROAD IN FLAT COUNTRY

Only a glance at the scenic effect of this Road of Remembrance is necessary to show how effective such planting can be in a flat, uninteresting farming country.

big forestry meeting at Syracuse in April, as reported in the May number of American Forestry. The prescribed activities of the three departments will permit of the erection of this memorial as long as the Conservation Commission and the New York State College of Forestry can supply trees. The College of Forestry has 10,000 elms in its nursery at Syracuse. These range from four feet to eight feet in height and can be appropriated for this purpose. The planting began near Syracuse on the main road between that city and Utica because of the short haul from the College Tree Nursery and the fact that the perfected plans covered this section.

YANKEE TREES IN FRANCE

Republished from San Francisco Chronicle, April 18, 1920.

(The American Forestry Association has undertaken the planting of native American trees as memorials to our soldiers who are buried on French soil.)

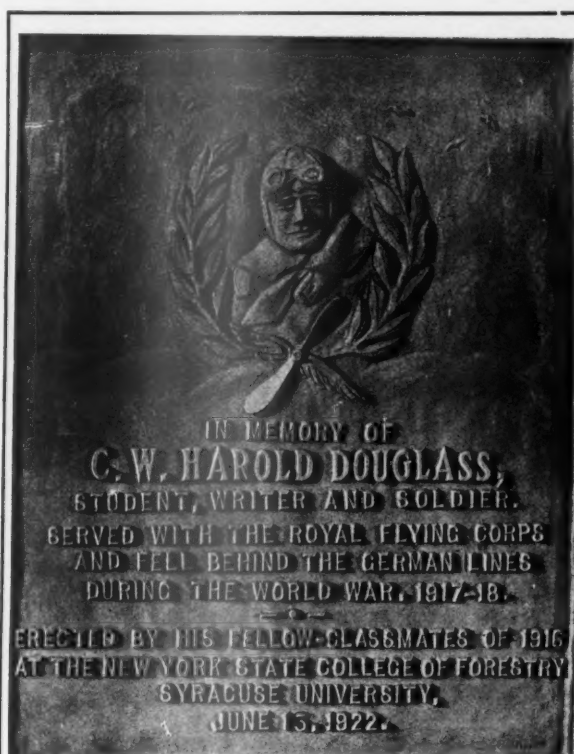
No futile wreaths that fade and die,
Whose life is but a day,
Can truly honor those who lie
So many leagues away;
Nor fainting blossoms represent
The hope, the strength, the urge
Of Youth incarnate—why, it sent
Them laughing, to the verge.

For those who perished overseas,
Our glorious host that lies
In France, let hosts of living trees
Gloriously arise.
Rise where charred limbs of older trees,
Flung mute against the sky,
To countless wanton cruelties
In silence testify.

And at some distant future day
When we, who mourn them now,
Because they died—the self same way
Have followed them, oh how
Shall we deserve so fine a thing
For our memorial,
As trees lit with the green of spring,
Or scarlet fires of fall?

The movement has gained headway steadily since its inception and the latest indication of this is the fact that Senator Medill McCormick, of Illinois, has sponsored a bill which provides for federal assistance in establishing Roads of Remembrance and which has been made a provision of the Snell Bill.

The Road of Remembrance has had an actual beginning in New York this spring on a large scale. The planting will be pushed as far as possible which means as long as weather conditions and the supply of trees permit. The work will be carried on by competent hands, as befits the splendid purpose to which the trees will be consecrated. In this way the upkeep and replacements will be reduced to a minimum and the health and longevity of the trees will be insured. Prof. Alan F.



THE DOUGLASS MEMORIAL

This is a reproduction of the memorial tablet erected by the 1916 Alumni Class of the New York State College of Forestry at Syracuse in honor of Lieut. Harold C. W. Douglass, who was killed June 11, 1918, when his plane fell behind the German lines. He was one of the first forestry college graduates to enter the service, joining the aviation corps. His daring and courage as a member of the Royal Flying Corps won the admiration of his British and French comrades. On June 11, 1918, he left his base on a scouting trip over "No man's land." He soared over the German lines while both sides engaged in fierce battle and he never returned. The career and life of this boy who gave his life unflinchingly for his country is well characterized by the tablet, which was designed by Hollis J. Howe, one of his classmates. It has been placed in the rotunda of the College of Forestry at Syracuse.

Arnold represents the Forestry College in cooperating with the Highways Department and the Conservation Commission. The planting when completed in accordance with present plans will be more than 400 miles in length. Some years may be required to plant the entire route between New York and Buffalo, but in the end the Road of Remembrance will become a thing of beauty and a noble monument commemorating the high patriotism that has always distinguished the American citizen-soldier. Such a monument will be particularly fitting because it will be a work of love for those who loved their country more than their life, as the New York Tribune has said, "It was through some tree-lined road in France that every man who played a man's part had to march to keep tryst with his destiny."

There are many beautiful roadways in New England where elms form a canopy over the road, but these are sporadic groups. Massachusetts has planted some of her roads and California boasts of stretches of tree-lined

highways; New York also has many indifferently adorned roads where the so-called shade trees have been planted



A CALIFORNIA WHITE OAK

Trees are a noble and inspiring feature of almost any landscape and the planting of such memorials to our soldier dead is strongly advocated by the American Forestry Association.

along lot fronts, but the extensive planting of trees on both sides of the arteries of vehicular travel is new in this country.



Underwood & Underwood

THE PLANTING OF THE GRANT TREE

On the 100th anniversary of his birth, the American Forestry Association planted an elm from the Grant farm near St. Louis near the tomb of General Grant on Riverside Drive. The picture shows (left to right) W. V. Hayden, president of the Grant Memorial Association; Gen. Isadore Isaacs, Deputy Commissioner of the G. A. R.; W. B. Boyce, of the American Legion, and Charles Lathrop Pack, president of the American Forestry Association.



National Photo

WASHINGTON'S OFFICIAL MARKER

The tree marker being placed in the public parks of Washington at the direction of Lieut. Col. C. O. Sherrill, who is carrying out the American Forestry Association's suggestion that the capitol of the country be in reality a National Arboretum. Miss Blanche Howlett has long been an enthusiastic advocate of the plan of marking the trees and earnestly urged that it be carried out.

PLANT ME A TREE

By Mary Alicia Owen

I am Fame.

Withered are my laurels and my bays,
Faded the glories of my yesterdays,
Crumbled my arches, my columns down,
Roofless my temples that the hilltops crown.
O men, for enduring memory

Plant me a tree.

I am Grief.

Mossy are my marbles mid the weeds,
Blackened the scroll that for remembrance pleads,
Sunken the mound that was flower-bedecked.
If you would save me from this wan neglect,
Giving a pledge of your constancy,

Plant me a tree.

I am Hope.

Though rooted is existence in the mire,
My arms yearn heavenward in desire,
Yearn heavenward and slowly, surely grow.
Forgotten is the mud that lies below.
If you can understand the spirit thus kept free,

Plant me a tree.

I am Faith.

Groves were my cathedrals long ago,
Sunshine and starshine kept them aglow,
Young trees were altars, old trees the roof.
Growth and strength, of God's presence were proof.
Recalling the Presence that there used to be,

Plant me a tree.

MEMORIAL DAY--THE NATION'S TREE DAY

MEMORIAL DAY has become the national tree day. The nation turns to the memorial trees it has planted and dedicates them on that day of reverence. In the years to come the nation will gather about its memorial trees as about no other memorials. This was shown in York County, Pennsylvania, on Memorial Day, when twenty-five miles of the Lincoln Highway was dedicated as a Road of Remembrance. This stretch of the famous road had been planted on both sides with memorial trees



National Photo

MRS. HARDING'S TROWEL IN DEMAND

Even now requests are coming in from women's organizations for the tree-planting trowel first used by Mrs. Warren G. Harding at a tree planting by the American Forestry Association. It was again used at the planting of the International Tree at the Pan-American Conference of Women. Since then it has been in many places throughout the country, the first request coming from Iowa from the Federation of Women's Clubs of West Union, Iowa, for fall planting.

from Wrightsville to Abbottstown. The Women's Club did the preliminary work and the trees have been turned over to the care of the Lincoln Highway Memorial and Tribute Tree Association.

The speakers at the unveiling of the tablets were Major R. Y. Stuart, Pennsylvania Commissioner of Forestry, and Charles Lathrop Pack, president of the American Forestry Association. Mr. Pack opened his address by reading a letter to the Women's Club of York from Mrs. Warren G. Harding, a vice president of the Asso-

ciation. This letter follows:

THE WHITE HOUSE

The Women's Club, York, Pa.:

Please allow me to congratulate you on the wonderful work you have brought to conclusion in the dedication on Memorial Day of the Road of Remembrance along the Lincoln Highway. In the planting of twenty-five miles of that famous highway you have erected a memorial that the entire country can enjoy in the years to come. May long life attend the trees you have placed in the care of the Lincoln Highway Memorial and Tribute Tree Association.

Sincerely yours,

FLORENCE KLING HARDING.

Following the invocation by Rev. Samuel H. Bell, chaplain of the American Legion, H. C. Ulmer introduced the speakers. Major Stuart paid glowing tribute to the Road of Remembrance idea and said his department was ready to co-operate with all organizations in the state in memorial tree planting. Mr. Pack told of the nationwide spread of memorial tree planting and how other links of the Lincoln Highway had been planted. In



ONE OF THE MEMORIAL ROAD MARKERS

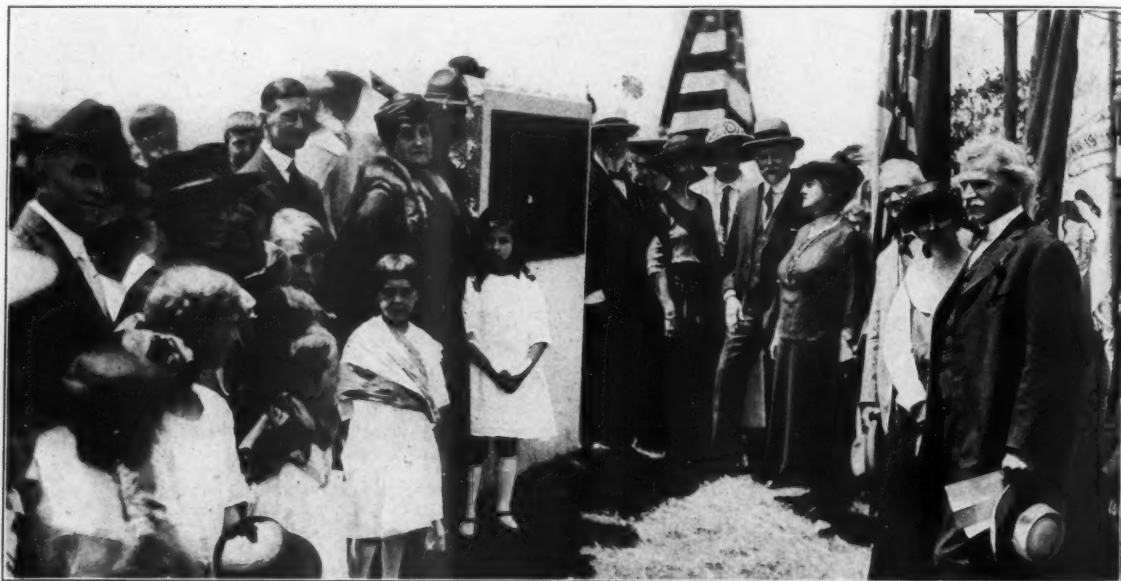
Two tablets were placed at either end of the twenty-five mile Road of Remembrance in York County, which was dedicated with impressive ceremonies on May 30, 1922.

conclusion he pointed out how whole communities could be brought together as in no other way by memorial tree planting and said.

"Such dedications as this on Memorial Day bring me to the thought that the Memorial Days of the future will be tree days. I believe that around these trees on future Memorial Days there will be renewed consecration by the people. A greater number of trees will be planted each year and a stronger current tend to make this nation a tree-planting nation. From trees the nation gets its strength. From trees 'that look at God all day and lift their leafy arms to pray' there will come a new life to the Union when the nation comes to know what trees

western terminus of the Road of Remembrance another tablet was unveiled. Here the invocation was said by the Rev. J. H. Nicely, of Hanover. Miss Mildred Elizabeth Lowe unveiled the tablet. The Rev. Abner S. DeChant presented the tablet to the American Legion, Lieut. Neill making the acceptance speech.

For two years the women have been at work on this Road of Remembrance and it is a fine example to the rest of the country of what can be accomplished. Leaders in the movement are Mrs. J. B. Hamme, Mrs. Ralph S. Cannon, Mrs. A. H. Hayward, Mrs. Carlton Hoff. Associated with them in the Tribute Tree Association are H. C. Ulmer, A. B. Farquhar, Mrs. Charles Moul, W. D.



AT THE UNVEILING CEREMONIES AT YORK

Some of those present at the unveiling of the tablet marking York's now famous Road of Remembrance. Right to left: H. C. Ulmer, Mrs. A. H. Hayward, Major R. Y. Stuart, Commissioner of Forestry of Pennsylvania; Mrs. J. B. Hamme, President Lincoln Highway Memorial and Tribute Tree Association; Charles Lathrop Pack, President American Forestry Association; Mrs. Ralph S. Cannon, Hon. A. B. Farquhar, Mrs. James G. Glessner, President Woman's Club of York. It was under the supervision of the club that the Highway was planted. The next man, with the hat off, is Ralph S. Cannon, and the little girl in front of the tablet is Miss Betty Cannon.

mean. Trees, like this highway, are for the people just as was the man for whom the highway is named. May these highways in their windings over the country bind its citizens more closely together and may every Memorial Day find us ready to consecrate them and ourselves anew to the memory of those for whom the trees live.

"Memorial trees are living monuments of memory for they lived gloriously just as did those for whom they are planted."

The Hon. A. B. Farquhar, who heard Lincoln make the famous Gettysburg address, recited that speech. At the

Broughe, R. S. Cannon, J. C. Schmidt, Robert McPherson, Samuel Small, Jr., while at Hanover the Women's Club, under the direction of Mrs. T. J. Little, Mrs. Emma Shirk and Miss Bertha Zeibel, greatly aided the project. York County is one of the pioneers in memorial tree planting on such a scale. More and more Memorial Day comes to be the nation's tree day. In Washington the American Legion dedicated anew the Memorial Avenue on Sixteenth street reaching to Walter Reed Hospital. From every section of the country come reports of memorial tree dedications and new plantings.

THE MEMORIAL TREE

The living monument is Light,
True emblem of our Liberty;
'Tis Faith and Hope and Charity;
'Tis ever Youth, gay, strong and bright;
'Tis heartbeats, Death's decree despite;
O'er Death it is a Victory;
The life of man is called a tree

In Holy Writ; and when its flight
A soul has taken to its rest,
And when a form is but a clod,
That monumental tree is best
Whose great limbs shower on the sod
Its fruit, as would good deeds attest,
To feed the little lambs of God.

—Marta Scott Conser.

THE "FOREST OF STATES"

BY L. G. McDOWELL

It is in the west apparently that people give the greatest attention to the beautification of their private and public grounds and highways through the planting of trees. Perhaps the reason for this is found in the admirable adaptation of the soil and climatic conditions to their growth. Another reason may be in the awakening of the public conscience to the appalling waste in that section through forest fires and extravagant lumbering methods. "Interesting people in shade trees is one of the

Union, but all our colonial possessions as well have been asked to contribute. Enthusiastic co-operation from these have been shown from the first, it being deemed particularly appropriate that Los Angeles should thus pay tribute to all the states in the Union, since 96% of its population is made up of residents formerly living in states other than California. There are numerous state societies and organizations in the city and it is fitting that through this movement it should be made possible



PLANTING THE MICHIGAN PINE IN THE "FOREST OF STATES"

This was the first tree dedicated in the Los Angeles Grove of State Trees, at Exposition Park, March 5, 1921. Left to right: W. M. Bowen, President Park Board; Mrs. Martha N. McCann, Member of Park Board; W. E. Tipton, President South Dakota State Society; Frank H. True, President Federated State Societies; Sam Young, President Michigan State Society; G. F. Amberger, Treasurer Canadian Maple Leaf Club, and George E. Platt.

first steps toward making them receptive to tree conservation."

This is one of the ideas Los Angeles had in mind when it launched its unique "Forest of States" project. Through its Chamber of Commerce, in co-operation with the City Park Commission, it is planting a grove in Exposition Park to be known as the "Forest of States." To this grove not only every state in the

for these societies to meet in future days under the beneficent shade of trees from their "home states." Beside this sentiment attached to the "Forest," it will offer wide educational possibilities, since, due to climatic conditions in Southern California, trees from all states will flourish in the Los Angeles grove. Many of these will be of odd and unusual types, sure to attract the attention of arboriculturists, who can here study specimens from

the Philippines and Alaska, as well as from temperate climes. In addition, of course, the park grove will provide an appealing beauty spot for sightseers in years to come. This is the first such collection of trees in existence accessible to the public. In this grove children may play, students may learn and state traditions be exemplified and cherished.

Some of the contributions to the Los Angeles grove were most appealing and throw an interesting sidelight upon the history and traditions of the states contributing. Trees and states as well as trees and human beings, do hold certain traits in common. So it seems that it was with a sort of instinct that each state selected the tree best setting forth its particular qualities and worth. Thus: Colorado sent a Blue Spruce, the mountain giant, a tree of great beauty and native of that state alone. Vermont, of course, sent the Sugar Maple—two of them. South Dakota, a Spruce, a hardy species of great vigor. Massachusetts two Oaks, red and white, the oak being the strongest of all trees, able to hold its own in more kinds of soil than any other. Connecticut contributed a "seedling from a seedling" from the original Charter Oak. Missouri sent a Walnut to represent vigor and fruition. Indiana a Sugar Maple, Tennessee a Maple and an American Elm, significant of this southern state's loyalty. Idaho a Pine. New York a Red Pine, for which species this state is justly celebrated. Nevada a Yellow Pine. Pennsylvania a White Ash, Arizona a Palo Verde, also a Silver Cypress, a vigorous tree, known for its gigantic bulk and long life. Utah contributed a Box Elder, Nebraska a White Cedar, a species of hardy growth, able to hold its own under the most adverse conditions. Maryland sent a Bald Cypress, Ohio a Buckeye, South Dakota a Black Hills Pine. Louisiana forwarded twin Magnolias, in honor of the twin grandchildren of the governor of the state. Alaska sent a Sitka Spruce and an Alaska Cedar, while seeds for propagating the famous Ausubo tree were received from faraway Porto Rico.

Perhaps the most interesting contribution of all, especially to the literary inclined, is that of an oak from the famous "Captain's Hill," in the town of Duxbury, Massachusetts. This hill was the site of the home and farm of Captain Miles Standish, and this oak, now transplanted to the lovely tropical setting in the Los Angeles grove is probably the direct descendant of oaks that grew on "Captain's Hill" in the days of the doughty Miles Standish.

Considerable interest has been shown and much difference of opinion came to the surface in the selection of trees. Many states found that they did not have a state tree, whereupon heated legislative debates followed. Some of the states, as did Kansas, held beautiful dedicatory ceremonies of blessing the tree in the legislative halls before starting it upon its journey. The Kansas tree, a fine young White Elm, chosen to represent the survival of the fittest, was one of the first to arrive, and was planted with fitting ceremonies by resident

Kansans in Los Angeles, on March fifth. In this first dedication many notables took part, among them Mr. W. E. Tipton, President South Dakota State Society; Mr. Sam Young, President Michigan State Society; Mr. G. F. Amberger, Treasurer Canadian Maple Leaf Club; Mr. Frank H. True, President Federated State Societies.

Final and more elaborate ceremonies will follow after all the trees are set, and a marked tablet will be placed at the foot of each tree, giving the name of the state whence it came, the kind of tree and its history.

Gettysburg Trees--Allies of the Union

PLANTING memorial trees is an excellent idea. The visit of the Boy Scouts under the leadership of Professor F. C. Copp, of Pittsburgh, and setting such a tree on the Battlefield of Gettysburg was a fine demonstration of Memorial Tree planting.

It is the aim of the Battlefield Commission to preserve the scene of the decisive battle of the war of the States as nearly as possible as it was in 1863. Before the field was taken under government control, some groves, in which severe engagements occurred had been cut down. These have been replanted and replaced with close likeness to those in which the fighting was done.

Trees in the Battlefield Park are dying yearly, many of them being scarred veterans, bearing heavy loads of shrapnel and lead. The years in most cases have covered up their wounds, but when these witnesses of the bitter three days of battle are cut up, the bullets and other missiles come to light. About these the grain of the tree is torn and jammed; several of these mementoes of the past lie near the heart of oak or hickory, and where the number is great doubtless they cause the early death of many trees.

There are several springs on the battlefield. However, little the trees on the drier heights and the inhospitable rock masses thrive, by these springs and bordering famous Rock Creek and Willoughby's Run are trees that have grown great. Rooted by the waters their leaf does not wither, and they bear their fruit regularly with the seasons.

Trees played a large part in the Gettysburg battles. McPherson's Woods, Ziegler's Grove, densely wooded Culp's Hill and Big and Little Round Top and practically every wooded spot, large or small, sheltered the fighters and enabled victories. They were faithful allies in the cause of the Union.

Trees gave then and continue to give their aid and blessing to the world. They helped to preserve the Union, and so America became peerless among the nations. It was this great America, unhampered by the problem of competing nations at home, mighty in manpower and wealth, that struck a terrific blow at the throat of the despotic foe of freedom, shattered his forces and gave emancipation to the world. So the fruitage of these trees is borne month by month and their leaves are still for the healing of the nations.

EXPLORING THE GARDEN

By Dr. R. W. Shufeldt, R. A. O. U., Etc.

(PHOTOGRAPHS BY THE AUTHOR)



ANY years ago, when Louis Agassiz was a member of the faculty of Harvard University and lectured to his students on Natural History, he once stated that a competent naturalist might spend an entire year on any average square mile in the valley of the Amazon, industriously collecting and describing what he found there; and that in that space of time he would hardly have more than commenced to exhaust what the area contained in the way of living forms and plants. From what I know of modern methods in biology, I would most emphatically very much reduce the extent of the area; multiply the time at least by five or more, and allow ten hours a day for the work, with Sundays thrown in. Now, in any semi-cultivated half-acre garden in this country—especially should it contain a small pond and a little brook—an all-round naturalist might undertake to figure and fully describe its animal and plant life, and several years would be required to handle the task with any thoroughness whatever; indeed, a long lifetime might be needed to complete the undertaking, and many, many big volumes demanded to publish the report.



MYRTLE OR YELLOW-RUMP WARBLER

Fig. 1—This well-known bird is among the very first to arrive in the North at the time of the vernal migration. In posing the little fellow, one of the secondary wing-feathers was displaced as shown; otherwise it is a new and unusual capture of the living bird.

Between water and earth plants, some fifty or sixty species could easily occur in such a place, not to mention several different kinds of trees and shrubs; among the fungi there would likely be various toadstools and their allies. There would be a long list of water and earth insects and larvæ. Add to these the millipeds and their relatives, near and remote; worms of several species; perhaps fish in the pond, also frogs, newts, turtles, and



WILD STRAWBERRY IN BLOSSOM

Fig. 2—In its normal habitat this favorite little plant blossoms early in the spring. In some meadows hundreds of them are found, and it also flourishes along roadsides and in waste places.

so on; toads, tree frogs, salamanders; with possibly one or two species of snakes. By observing the visiting birds, quite a long list would result in the space of a lifetime—not to mention such mammals as moles, field mice, mink, or maybe a weasel, and, perhaps, a stray skunk.

Think of working out the life histories, the anatomy, the physiology, and the rest, of all these different plants and animals! Surely one would have to be industrious to achieve the undertaking in a lifetime. I have applied myself continuously to such work for considerably more



THE MYRTLE WARBLER

Fig. 3—The female of this species is not as brightly colored as the male bird here shown; that is to say, the yellows and blacks in the plumage are markedly duller.

than half a century, having published a number of books and more than a thousand memoirs and papers devoted to such topics, illustrated by many thousand figures—yet all this would not begin to describe the animal and plant life that we would meet with in our half-acre garden; indeed, it would not even adequately describe one thousandth part of it. Huxley devotes an entire volume to the Crayfish; Mivart gave us a still bigger one on the Cat; and my own work on the muscles of a single bird—the Raven—was equally extensive, carrying nearly a hundred figures. So, it would require fully five hundred big volumes to thoroughly describe the material referred to in the last paragraph.

In this country there are thousands of gardens of the kind I have in mind, as there are thousands of others of a different sort—among the latter a class of garden so trimmed up, so to speak, that all animal life and all wild plant life has been completely eliminated from them. Personally I prefer the wild variety, with just a dash of modern cultivation in evidence; one in which it is no rare thing to see a chipmunk running across one of the paths, or a red-headed woodpecker hammering away on the side of the trunk of a tree—with all else in keeping. For the nonce we will call this garden our garden, and in it we may—indeed, we can—often compare the highly cultivated flowers with the wild varieties from which they were, in time and through careful selection, derived. Much of this floral breeding or artificial selection was, long ago, done in the Old World; but later on American horticulturists have paid not a little attention to it. In this connection it is interesting to compare the elegant cultivated strawberries at hand with their wild relatives—the latter being seen yonder in the un-

touched corner of our garden (Figure 2), where, too, some lovely wild violets grow (Figure 12), the latter, in the estimation of many, quite outclass in beauty not a few of their cultivated descendants.

As we know, a large number of these cultivated plants found in our gardens throughout the country manage, through various kinds of seed-dispersion or otherwise, to find their way back to nature. They are then generally called “escapes;” and it is not long, a few generations perhaps, before their descendants have reverted to the wild forms. Some, like the blackberry lily, change not at all, its escapes closely resembling the plant as we find it growing in our gardens. Upon the other hand, the highly cultivated blackberry will, in a few generations, revert to the wild type as found growing in uncultivated fields and along roadsides everywhere (Figure 4).

Plants of the genus *Narcissus*, of which there are some twenty species, chiefly European, are also found in nature as well as under cultivation. The lovely and highly fragrant paper-white *Narcissus* is an excellent example, and this kind is especially widely known for the reason that many thousands of its bulbs are sold in flower stores from one end of the country to the other. Most of these



THE WILD BLACKBERRY

Fig. 4—A favorite plant which with its fruit, its pure, white blossoms, and pretty leaves, is beautiful to behold at all seasons of the year. However, its thorns and its being a harbor for chiggers are two of its drawbacks.

are grown as house-plants by placing from one to half a dozen of them in a suitable receptacle filled with small stones and water, the latter just covering the upper layer of stones. In order to start them well, they should be kept in a dark and cool place for at least a fortnight, or until the roots are largely in evidence, and then brought gradually to the light.

One of the shade trees in our garden, the leaves of which appear to be in a very dilapidated condition, has suspended from its many twigs curious little elongate bags, each about an inch or an inch and a half long, pointed at either end and stuck over the greater part of its outer surface with many small sticks. These are the cocoons of the common "Bag-worm"—a creature with a very remarkable history. The insect that makes these little bags is the larva of a moth, which is very injurious to our shade trees, especially in certain city streets in the eastern half of the United States. Every season or so, the shade trees that line the avenues and streets of Washington are special sufferers from this "bag-worm" and the only remedy is to collect the "bags" in the autumn and winter months, pile them up somewhere and build a fire over them; or, if convenient, consign them to a furnace fire. A year or so ago a prize was offered to the children of that Public School of Washington which could collect the greatest number of bag-worms from her shade trees. An enormous pile of them was shown



EXAMPLE OF TREE BUDDING

Fig. 6—Here is also one of our hickories in early spring; it should be carefully compared with the one in Figure 5.

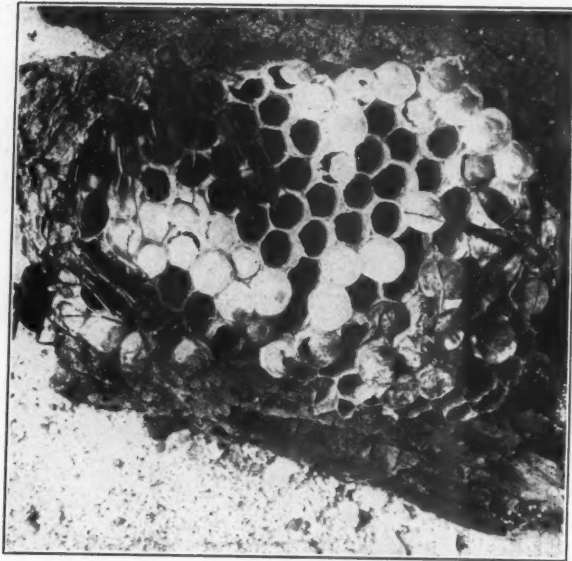


THE MODE OF TREES IN BUDDING

Fig. 5—We have here represented the opening buds of one of the hickory trees, as they first appear in the spring. This is a Washington, D. C., specimen, and collected by the author early in April.

me at one of the schools, the children of which had entered this contest. Much to the disgust of the exhibitor, I quickly demonstrated that more than four-fifths of the bags were empty—the insects having left them. They had been collected at the wrong season, and so no benefit followed. When the task is undertaken at the proper time and thoroughly done, marked benefit to the tree often follows, as was the case in the parks of St. Louis a few years ago. My illustration in a previous issue well shows a typical "bag" of one of these pests. Uninformed people often wonder what they are, as they notice them swinging in the breeze suspended from the twigs of some favorite shrub or tree in their garden.

In such a garden as I here describe, a great many species of insects will readily be found during the seasons when they occur. Often several kinds of lovely butterflies will hover over the flowers or alight about the little wet places in the pathways, or, perhaps, on the muddy margin of the pond. Then, too, if one goes out into the garden at night carrying a bright light, fine examples of our moths may also be seen flitting about, to be, perhaps, collected and studied. Often, during the day, a handsome Luna moth or a Cecropia may be found resting in some place, having just emerged from its cocoon, which latter you may chance to find not far away. Wasps, hornets and various bees, too, are frequent visitors, and their names and habits are well worthy of study. Quite a volume might be written on the wasps



FLORIDAN WASPS AND THEIR NESTS

Fig. 7—Most people are familiar with what this picture shows; and as a photographic result it is a very good one. Note the open, unused cells—the closed ones contain larvae. Note, too, the various poses of the owners of the establishment.

alone, especially such a "social wasp" as I show in my Figure 7, and the same may be said of the white-faced hornet here shown, in Figure 10.

In some respects, the habits of the wasps are like those of certain bumble bees, while they construct the well known, flat, gray paper nests for their young, which are familiar to all observers living in the country. These nests are often found even in very small city gardens, should the insects happen to take a notion to build there—or, perhaps, under the roof of the kitchen porch or in the shadow of some convenient part of the under side of the fence rail. They are peaceful neighbors enough if left severely to themselves, but very combative if interfered with to even a very slight degree.

These wasps construct their paper nests from wood-pulp; and it is quite likely that ages ago, when the human race was in a far more primitive state than it is at present, it gained its idea in paper manufacture from the social wasps, which had the same habits then as now. Most of these social wasps obtain the material from which they make their paper from the looser parts of the surface of old, unpainted fence boards, rails, house-shingles and so on, and it is formed into the necessary pulp by being chewed up with their saliva as a mixer.

But, as I say, one having the requisite knowledge might readily write a book—and a good-sized volume at that—on our wasps alone; and to tell the truth, a great many volumes have been published about them. So that the owner of such a garden as is here described would find it a matter of the greatest possible interest to obtain some of these books, and compare the statements made in them, and the cuts given, with the living insects and

the structure of their nests as he meets with them on his preserves in the summer time. It is very profitable to compare such histories with the corresponding ones as they refer to our many species of ants, bees and hornets—relatives of the wasps. The white-faced hornet, shown in Figure 10, is the insect that builds the big paper community nest, with which we are all so familiar.

It is truly wonderful how many birds will visit our modest garden during the course of a year; they will, during the spring migration, be most in evidence from early daylight till breakfast time, and then again as evening comes on. When autumn approaches, the migration that takes place is equally interesting; but then, we'll see more or fewer birds in our garden during all the months that make up the seasons. In winter we may look for various finches, sparrows, crossbills, hawks, owls and not a few other species that come to us during that time of the year. Should your garden be fortunately situated with respect to seclusion and quiet, it is not unlikely that a number of birds may nest within its precincts. A lovely pair of Kingbirds may make their home in your apple tree (Figure 11), or, should you understand how to invite them with food and nesting-places, quite a host will reward you as tenants and neighbors. Especially do I refer to the robins and the wrens, the blue-birds and the summer warblers, and, indeed, not a few other species. Occasionally some birds will nest in such



BEAUTIFUL TREE BLOSSOMS

Fig. 8—The way the Ash-leaved Maple or Box Elder wakes up early in April in the District of Columbia; it may grow to be seventy feet high, flourishing best in swamp-lands and along rivers and streams where the soil is rich.

a convenient place that your camera may get in its work; and you may, during the season, be led to take some notes really worth the while, making bird histories that others will be glad to read should they ever appear in print. Notwithstanding that so much has been written about our birds, coming, as it has, from many, many pens, there still remains ample material for the generations of young ornithologists in the years to come.

Then there are the warblers which have been mentioned in a former paragraph—and what a wonderful group they represent! Among the first arrivals of them in the spring is the Myrtle or Yellow-rump Warbler, an elegant little fellow here shown in Figures 1 and 3—a male bird, from life, as he appears on two sorts of perches. As is the rule in this group, the male possesses a more lively coloration of plumage than the female, although its pattern is about the same. A conspicuous median stripe of brilliant yellow ornaments the crown; the lower back or rump is the same, and there is some yellow on the sides—otherwise the plumage is black, gray and white, as indicated in the figures. Among the warblers generally the chief colors are various shades of olive, gray, orange, yellow,

rarely red, black and white, blue, and the dull greens of various depths. The manner in which these colors are distributed and contrasted accounts for the great beauty of these little birds, while in the matter of song they are far behind the real songsters of our avifauna. Their little twittering notes are charming nevertheless, especially when we come to know them, and can, without seeing the bird, recognize the species by its notes or simple song. It requires several springs of careful attention and study to master this, and it truly is remarkable how proficient some of our ornithologists have become in this accomplishment. Not only are the notes recognized when any particular warbler gives vent to them, but the listener can imitate them to such perfection as to deceive

the songster itself. Recently there has been placed on exhibition in the lower hall of the United States National Museum, at Washington, cases containing mounted specimens of nearly all of our true warblers; so that those interested in our birds, and in this group in particular, may study their forms and plumages at their leisure. We have over fifty species of these little birds in our avifauna; some are western types and never occur in the Middle or Atlantic States—and *vice versa*.

Then, should there be some old trees on the place, we are sure of visits from the noisy little White-breasted Nuthatches (Fig. 9). This little gray, black and white fellow was, years ago, known to me as the Black-capped Nuthatch; while Wilson, to make sure of the species, called it by both names, giving the first the preference.

Pennant, an ornithologist of the last century, considered that well-known bird of ours merely a variety of the European Nuthatch—a very patent error. It was, however, a very common notion of the continental naturalists of his time to make the claim that all the plants and animals of this country were but mere “varieties” of those of the Old World. Here, in the Middle States, this little fellow nests

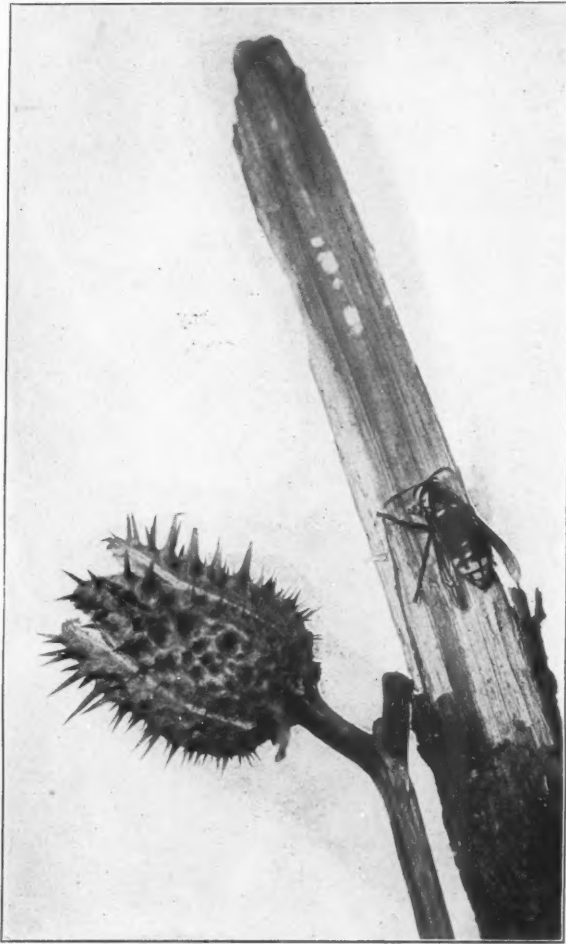


LITTLE WHITE-BREASTED NUTHATCH

Fig. 9—A very familiar species of Eastern United States, representing a male specimen, taken natural size and in a characteristic pose.

early in April, generally selecting a hollow in some tree where a hole leads into it. Sometimes they have been known to select a hollow fence-rail for the same purpose. The female lays, as a rule, five pretty little white eggs, rather dull, and speckled with some shade of brown at the larger end. She is the recipient of the closest attention from the male during the period of incubation; he keeps her supplied with food, and constantly visits the entrance to the nest, peeping in to see that all is well with his much beloved mate. Should she come out for food or for a little exercise, the male redoubles his attentions, keeping up a perfect string of quaint love-notes to assure her of his affection and guardianship.

Far back in ornithological lore we were told that the



THE WHITE-FACED HORNET

Fig. 10—A handsome black and white insect and one of the most conspicuous representatives of its genus, which is capable of giving a sting of great severity.

nuthatch, or a nuthatch, was in the habit of cracking the various kinds of nuts it came across, in search for the maggots or other worms that might be found in them; further, the bird gathered quantities of worm-eaten nuts for a winter's supply, hiding the same in hollows of trees.

All this is not entirely true, as no nuthatch that ever lived could crack a hickory nut or an American walnut. On the contrary, these birds feed largely on various species of small bugs, larvæ, ants and seeds; they search for such food incessantly during the day, thus rendering signal service to our forest trees and timber. A writer at hand says of this favorite little bird that it "gets its living from the trunks and branches of trees, over which it creeps from daylight to dark. Insects and spiders constitute a little more than 50 per cent of its food. The largest item of these are beetles, moths and caterpillars, with ants and wasps. The animal food is all in the bird's favor except a few ladybird beetles. More than half of the vegetable food consists of mast—acorns and nuts and large seeds. One-tenth of the food

is grain, mostly waste corn. The Nuthatch does no known injury but much good."

Personally I have studied and collected the White-breasted Nuthatch from Long Island Sound, and southward through the Middle States, and I am free to confess that I have yet to see one of them having anything to do with what in any way resembled a nut. Wilson, who was a close observer of the species when it was far more abundant than it is now, tells us that "it is, however, said, that they lay up a large store of nuts for winter, but, as I have never either found any of their magazines, or seen them collecting them, I am inclined to doubt the fact. From the great numbers I have opened at all seasons of the year, I have every reason to believe that ants, bugs, small seeds, insects and their larvæ, form their chief subsistence, such matters alone being uniformly found in their stomachs. Neither can I see what necessity they could have to circumambulate the trunks of trees with such indefatigable and restless diligence, while bushels of nuts lay scattered round their roots."

Apart from its great abundance, Wilson's observations on the habits of the White-breasted Nuthatch are fully in agreement with my own. He says it "is common almost everywhere in the woods of North America, and may be known, at a distance, by its notes, *quank*,



KINGBIRD, OR TYRANT FLYCATCHER

Fig. 11—A brave little species which in defense of its nest and young, does not hesitate to attack any eagle or hawk that flies within its neighborhood.

quank, frequently repeated, as he moves, upward and down, in spiral circles, around the body and larger branches of the tree, probing behind the thin, scaly bark of the white oak, and shelling off considerable pieces of it, in search after spiders, ants, insects, and their larvæ. He rests and roosts with his head downwards, and appears to possess a degree of curiosity not common to many birds; frequently descending, very silently, within a few feet of the root of the tree where you happen to stand, stopping, head downward, stretching out his neck in a horizontal position, as if to reconnoitre your appearance; and, after several minutes of silent observation, wheeling round, he again mounts, with fresh activity, piping his unisons as before. Strongly

The cut of the White-breasted Nuthatch illustrating the present article is of one I had alive for a time, which I captured near my home in Washington. I made several photographs of it, it being a male, and the best of these is here shown. The female of this species is not as brightly colored as the male, the black being rather dingy, especially on the crown of the head and often elsewhere in the plumage. We have a number of interesting nuthatches in our United States avifauna, and some of these will receive my attention in future issues of *American Forestry*.

One may often study in a garden, in the early spring, the budding of various trees, and this study is a most interesting as well as important one. Our space here



BLUE AND CROWFOOT VIOLETS IN BLOOM

Fig. 12—All of our American violets, under proper conditions, thrive well when transplanted into our gardens.

attached to his native forests, he seldom forsakes them; and, amidst the rigors of the severest winter weather, his note is still heard in the bleak and leafless woods, and among the howling branches. Sometimes the rain, freezing as it falls, encloses every twig, and even the trunk of the tree, in a hard, transparent coat or shell of ice. On these occasions I have observed his anxiety and dissatisfaction at being, with difficulty, able to make his way along the smooth surface; at these times generally abandoning the trees, gleaning about the stables, around the house, mixing with the fowls, entering the barn, and examining the beams and rafters, and every place where he may pick up a subsistence."

will admit of giving but a few examples of the trees, and I have selected, as illustrations, three very beautiful ones, which are shown in Figures 5, 6 and 8—the first two showing the opening buds of the hickories, and the third is the ash-leaved maple, also known as the box elder. These tell their own stories; and, as I have frequently pointed out, foresters and other students of trees can make no better use of their cameras than to secure a full collection of such studies, arranging the photographs with full and accurate notes in an album suitable for their permanent preservation.

Hornets, bees and wasps are constant visitors to gardens in the country, and sometimes to those found in

the hearts of our cities. The study of their habits in nature is brimful of interest, and there is a large American literature upon the subject which may be examined with great advantage. In order to appreciate their forms, characters and coloration, one should capture specimens of the various species, and this is readily accomplished with a wide-mouthed bottle and a piece of stiff cardboard two or three inches square—or enough to cover the mouth of the bottle, with some to spare. If the bottle is brought very gradually and silently to one side of the insect, with the mouth towards the specimen, the cardboard being handled in the same way in the left hand, it is generally an easy matter to secure your specimen from the flower by skilfully closing the two together. Be sure the bottle is clean and of very clear glass, for then you can examine your captive through it to the best advantage.

In Figure 7 we have a wasp and its nest sent me by a friend in Florida; it is one of the reddish kind that builds the form of nest shown; while in Figure 10 I have given a fine cut of the common White-faced Hornet of the East—the one that builds the big paper nest with tiers of paper cells inside. As we are all aware, the sting of these insects is very severe, especially that of the hornet shown in Figure 10. If the victim be a man, and a sufficient number of these insects sting him during an attack by them, he may die from the amount of poison injected, which has happened although in rare instances.

In New England, many years ago, I came across one of these paper nests of the White-faced Hornets in an extensive pasture field, and it was situated in an angle of the surrounding stone-fence. Evidently it had been attacked as it was considerably battered through stones having been thrown at it. Believing the owners to have been completely used up, I also incautiously threw a stone at it, and this caused the inmates, of which there were many, to issue for a fresh attack. One wasp promptly stung me between the eyes, and the lids of both soon swelled so that I was, to all intents and purposes, blind. Fortunately, I knew the country well; and so, by feeling my way along by the fences, home was reached in the course of an hour or more; but it was several days before my physiognomy resumed its normal appearance, and the family ceased asking me whether the hornet had been a male or a female; or whether it made any curves when it came my way; or "did it fly backwards in order to sting me in the way it did," together with similar sympathetic inquiries.

Few insects have such interesting habits as the bees, hornets and their immediate allies; and what has been written about them furnishes reading that even a layman will take to and enjoy.

The old clock has just announced 5 A. M. Hear those "peepers" down in the marshy end of your little pond? and the rich notes of the first brown thrasher of the year, as he pours them forth from the topmost twig of the lone birch tree close to your window? Ah,

spring is indeed here again; and now is the time for a morning stroll in your garden, in that you may hear and see things as you breathe the glorious air of this most lovely season of the year—laden as it is with the fragrance of flowers that carry such a volume of happy thoughts to your mind.

THE teacher had been reading to the class about the great forests of America.

"And now, boys," she announced, "which one of you can tell me of the pine that has the longest and sharpest needles?"

Up went a hand in the front row.

"Well, Tommy?"

"The porcupine."—*Tit-Bits.*



Photograph by A. Sargent

THE KENTUCKY COFFEE TREE

Claimed to be the largest and handsomest one of its kind, this tree has been nominated for a place in the Hall of Fame for Trees by Cora June Sheppard, of Shiloh, New Jersey. It stands 75 feet high and was planted in 1804 directly in front of the historical Verplanck mansion at Fishkill-on-the-Hudson, occupied for some time by Baron Steuben during the Revolution and the scene of the first meeting of the Society of the Cincinnati. The property on which the tree was planted came into the Verplanck family from the Indians, in the reign of James II., King of England in 1863, and it has remained in the family ever since.

FRANKLIN B. HOUGH--A TRIBUTE

AS July 20th of this year is the centennial anniversary of the birth of Dr. Franklin B. Hough, the acknowledged "Father of American Forestry," it is befitting that we note in this issue something of his personality and the thoughts which started him in a career which resulted in interesting the United States government in the care of its forests. For his unselfish devotion to this cause until accomplished the American nation will always owe him a debt of gratitude.

We learn from his biographer that as a young man he was of a studious nature, and that he acquired an advanced education in spite of the hardships which young men have to encounter who work their way to a college degree.

He graduated from Union College in 1843, and from the Western Reserve Medical College in 1848.

His enthusiasm in scientific research from boyhood up was boundless. It was of the kind which inspired others with whom he came in contact, and while he appreciated enthusiasm in others in all branches of science, his special interest lay in the fields of geology and botany.

His extensive journeys afield in pursuit of these studies doubtless did much to build up the exceptionally good physique with which he was endowed, for he was wont to refer to his journeys afoot of twenty or more miles in a day, and carrying, perhaps, as many pounds of precious mineral specimens, as merely incidents.

He amassed considerable collections, and his articles in the press on his early observations in various fields of natural science were full of enlightenment and interest.

They naturally came to the attention of others of kindred interest elsewhere, and acquaintance would result which sometimes ripened into friendships waxing stronger and of more mutual interest as time went on. Among the strong personal friendships thus formed in early days were those with Louis Agassiz, John S. Newberry, Spencer F. Baird and others who have left lasting influence in their respective fields of science.

After his return from service in the Civil War as a surgeon he devoted himself entirely to scientific and literary work, and in the years which followed wrote many books and articles of importance. His biographer in referring to them states:

"There is probably no son of New York whose biblio-

graphical record shows so many, so varied, so extended and so valuable a contribution to the literature of the state."

In referring to Dr. Hough's characteristics this biographer, after a long personal acquaintance, writes:

"He had a very remarkable power of concentrating his mental energies on one subject, and therefore made himself master of it with unusual rapidity. He made himself, in this way, successively, a good botanist, a good mineralogist, a good compiler of history, a good statistician, a good forester.

"He had a good working memory, so that new facts with him fell easily into place with others he had gained.

"He was conscientiously thorough in his work. He spared no labor himself to bring his statements down to the last degree of certainty."

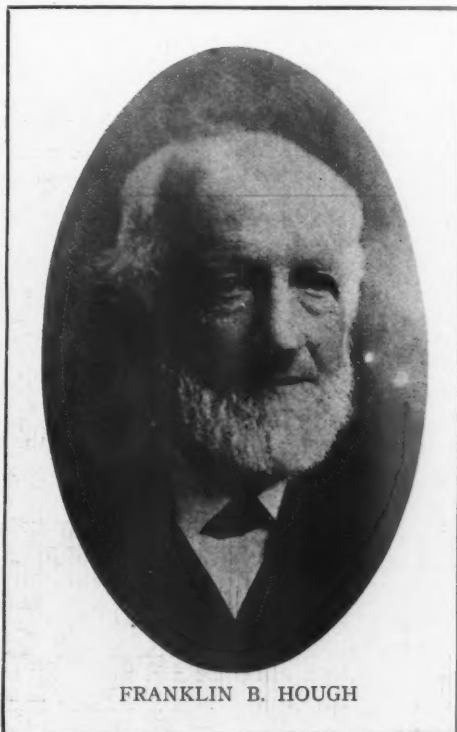
Such was the make-up of the man who was destined, in the self-imposed task, to effectually stem the tide of public sentiment regarding the use of our forests, and to formulate and carry into execution plans which resulted in the commencement of their management by the government—the establishment of the United States Division of Forestry (now called the Forest Service) of the Department of Agriculture.

To understand some of the obstacles he had to contend with we must appreciate that from the commencement of settlement by white man the policy had been to destroy all the forests possible and make ready for agriculture. That became a maxim which governed generations and was still being blindly followed by the masses of landowners; but thinking men

had begun to reason that such measures should not be continued indefinitely.

In those days Dr. Hough was twice Superintendent of the New York State Census, for the years 1855 and 1865, and while comparing these two census reports he noticed a great falling off of timber supplies in certain localities during the period of ten years. "It did not take much reasoning," quoting his own words, "to reach the inquiry, 'How long will the supplies last—and what then?'"

He was convinced that wanton destruction of the forests must stop as soon as possible, and provision be made for the proper use and perpetuation of those that are left. He reasoned that it was a matter in which the gov-



FRANKLIN B. HOUGH

ernment should act, and he lost no opportunity to impress upon others of influence the importance of his subject.

But what could a private individual do to change a deeply rooted belief on the part of the public that the forests should be destroyed?

A plan finally occurred to him which proved true to his hopes. He was a member of the American Association for the Advancement of Science, and he reasoned that if he could secure action by that august body recommending that the government take steps in the management and preservation of its forests it would be sure to have weight with the authorities at Washington.

He accordingly prepared a forceful paper entitled "The Duty of Government in the Preservation of Forests," and read it before the A. A. A. S. at its meeting in August, 1873. In it he suggested that a committee be appointed to memorialize Congress and the state legislatures on the importance of the subject. This was done, and he was made chairman of the committee.

We cannot here review the many months of anxious labor, interviews, rebuffs, disappointments, and only occasional encouragements with which Dr. Hough and the few that were with him met before final action by Congress was taken. (See "The Incipency of the Forestry

Movement in America," *American Forestry*, August, 1913.)

At the last moment before the close of the second session of Congress in which the subject had been brought up, final favorable action was taken, and the law was passed establishing the Forestry Division of the United States Department of Agriculture. It was a victory won by Dr. Hough and his small band of adherents, which has been of ever-increasing value and importance to the nation.

As illustrative of the general lack of appreciation of this subject in those days only a paltry appropriation of \$3,000 was made for the first year's expenditures of the new division.

Dr. Hough was appointed the first Chief of the new division in 1876, and prepared the first reports issued. They have been looked upon as "the foundation upon which our forestry system has been building since," using the words of one of his successors in office.

In a review of the first report, by an officer of the Wurttemberg forest service the following statement was made:

"It awakens our surprise that a man not a specialist should have so mastered the whole body of American and European forestry and legislation."

THE FAXON WHITE PINE PLANTATION

A TWENTY-EIGHT-YEAR-OLD plantation of white pine is shown in the foreground of the picture, on the side. Mr. Faxon, the owner of this plantation, began planting white pine 36 years ago. He has the honor of having set out the oldest white pine plantation in New York State, although he is still a comparatively young man. For the portion of the plantation which is now 36 years old, Mr. Faxon has been offered \$500 per acre for the timber "on the stump." As the trees are making their most vigorous and profitable growth at this age, Mr. Faxon has refused to sell. In the background is shown a white pine stand which occupies land that was cultivated when Mr. Faxon was a boy. The pit where potatoes were stored 50

years ago is still plainly in evidence. A dense stand of natural growth white pine is just as profitable as planted pine. This fact is illustrated by a statement contained in a bulletin of the United States Department of Agriculture as follows: "Two acres of white pine, near

Keene, New Hampshire, were sold three or four years ago, before the war prices, for \$2,000, on the stump. The total stand was 254 cords, which equals 170,000 board feet, or an average of 85,000 feet per acre. The trees were from 80 to 85 years old; so the growth on each acre was about 1,000



Photograph by A. B. Brooks.

THE FAXON PINE PLANTATION AT CHESTERTOWN, NEW YORK

feet per annum and the gross returns about \$12.20 per acre per annum." So Mr. Faxon has a property of high actual as well as potential value.

WHAT FORESTRY MEANS TO SOUTHERN COMMERCE

By Ovid M. Butler, Forester, American Forestry Association.

Before the Commercial Secretaries Association, Nashville, Tennessee

I DEEPLY appreciate this opportunity to address you on forestry as related to Southern commerce. It is a subject which any organization of business men, and most particularly one representing commercial leadership, cannot long escape. Forestry is a business. Its object is to grow timber crops on lands chiefly valuable for timber crops. I believe that within ten years the forest problem will be recognized as the most pressing industrial problem confronting the South.

That statement, it may be charged, is verbal extravagance. Let us, therefore, briefly take stock of what has happened, what is happening, and where the South stands today in the competitive lumber markets of the United States. For two decades this south land has led the world in lumber production. For three generations it has led the world in the production of naval stores. Since 1900, the southern pineries have contributed more than 50 per cent of the softwood lumber consumed in America. From the beginning of the naval stores industry, they have contributed practically 100 per cent of the turpentine and rosin used in this country. In addition, they have supplied for export an amount greater than the naval store exports of all other nations combined.

With the possible exception of cotton, southern forests have been the South's greatest producer of wealth for more than a quarter of a century. They have brought to your States 20,000 sawmills, representing an investment of more than half a billion dollars. They have created an industry which stands first among industries in six southern States, second in four and third in three. They supply employment to almost half a million people. In the last 20 years, they have brought into the South from the sale of lumber and other forest products alone, upwards of 10 billion dollars.

In view of these impressive facts, it is unnecessary to dwell upon the extent to which southern commerce depends upon a continuous supply of raw wood. It is well to bear in mind, however, the ramifying character of this dependency. From your great furniture industry, centering at High Point, North Carolina, to the oil industry of Texas, the products of the forest are essential elements of business. Wood for boxes is as necessary to the citrus industry of the South almost as the fruit itself. Experience has long ago proven that the ease and price at which an industry can obtain its wood requirements often determines its ability to meet competition in the world's markets.

American business, let us remember, is built upon competition. The South today occupies the most dominant competitive position of any region with respect to the lumber trade. It is a common saying that southern pine sets the price of softwood lumber. The reason lies not in the fact that the South contains more than

one-sixth of the nation's remaining softwood, although that is a contributing factor, but in the fact that forest exhaustion has eliminated other eastern regions as effective competitors. In that situation the South, by chance, profits today merely because her forest capital is not yet wholly spent.

What has happened to place the South in this commercially advantageous position? American lumbering, as an industry, began with the early settlements in New England. It spread slowly into New York and then following 1850, in order to keep pace with the rapid sweep westward of land settlement and commercial development, it moved swiftly into Pennsylvania and on into the Lake States. By 1880, the center of lumber production had shifted to the Great Lakes region. Twelve years later this region reached the peak of its lumber production. In the meantime, the lumber-jack, followed by the sawmill, had pushed into the great hardwood forests of the Ohio Valley, the mixed forests of the Appalachians and the rich pineries of the South Atlantic and Gulf Coast States. In small numbers, they had begun pushing across the Prairie States into the Rocky Mountains and into the heavy forests of the Pacific Coast. Following 1900, the Southern States rapidly took the lead in lumber production.

Step by step, the industry has moved westward, as one region after another has been cut out—first New England, then New York, next Pennsylvania, following that, the Lake States and finally the central hardwood region. Today, the greatest lumber markets in the whole world lie at the very doors of these regions, but by reason of exhaustion of their forests, they are helpless victims of their own harvests. Their forest cupboards are virtually bare and their own industries must compete one against another and with adjoining regions for imported lumber transported from distant parts at high freight rates.

Of the original stand of saw timber in the United States, only about two-fifths remain, 61 per cent of which lies west of the great plains and 23 per cent in the Southern States. Only 16 per cent in scattered fragments remains in all the rest of the country, including New England, the Middle Atlantic, the Central and the Lake States. This great territory not only contains 60 per cent of the nation's population, but it is the richest and most highly developed area in the country. It is the hub of the world's greatest lumber markets. The South's proximity to those great markets, coupled with the absence of a strong competing region closer than the Pacific Coast, 3,000 miles distant, give it a commercial advantage unequalled in the history of American lumbering, if not in American business.

But what is happening in the South? It is an old

saying that history repeats itself. There can be no doubt but that the history of lumbering in New York, Pennsylvania and the Lake States is now repeating itself in the South. The industry has passed its crest and is breaking camp, so to speak. There are ample evidences. The fact that in the South the cut of saw timber is now more than five times the annual growth carries some idea of the rate at which virgin stumpage is disappearing. Your original pine forests covered some 125 million acres and contained close to 650 billion feet.

Four-fifths of the original yellow pine forests of the South have now been cut. The remaining fifth is going rapidly.

It has been the history of other timbered regions that, beginning with small and scattered exploitation, the lumber cut increased steadily to a point where the industry was fully developed and then as exhaustion of stumpage set in, decreased gradually until production became a small factor in the industrial life of the region. For example, the State of Michigan, which led all States in lumber production from 1870 to 1895, today supplies a lumber cut less than one-half that of the State of Massachusetts. The South is now passing through such an era. The production curves of the Southern States are falling rapidly. Since 1909, the cut of southern pine has declined 31 per cent.

Census figures for 1920 show that in that year the South yielded its lead in lumber production to the West. They show that the number of southern mills cutting over one million feet a year decreased by 490 or 20 per cent in 1920 as compared with 1919. It is highly significant that during that same period the number of mills on the Pacific Coast showed a gain of 27 per cent. These figures go to confirm testimony given before a Congressional committee by a representative of the Southern Pine Association to the effect that a survey of 5,400 southern mills, representing over 50 per cent of southern pine production indicated that by the end of December, 1923, 81 per cent of these mills will have exhausted their timber and ceased production.

Let us examine for a moment into what the lumber business means in the commercial life of a southern State. Take Mississippi, as an example. According to the last census, the forest industries of that State rank first in importance; they employ 70 per cent of the State's wage earners and the manufactured value of their products amounts to \$300,000,000 annually or 60 per cent of the value of all manufactures in the State. Will it be asserted that the decline of that industry is of no moment in the commercial welfare of the State?

These things are mentioned merely to emphasize that you are today face to face with a great industrial problem here in the South. That problem is to make permanent your forest industries. You have before you as examples of inaction the north central group of States which have passed from lumber exporting to lumber importing States. They are paying a tribute of \$300,000,000 annually to import lumber from the South and the West,

and the freight haul is adding from 50 to 150 per cent to the prices.

Contrast with that situation the South with its remaining forest reserve. Instead of \$300,000,000 leaving your States every year in exchange for imported wood, your forests are bringing into your southland a third of a billion dollars annually. But, gentlemen, if you would preserve that balance in your favor the time for action is at hand. A further shrinkage in your pine industry is inevitable. It has been estimated that within 15 years the South will not be producing enough lumber to meet its own local demands and will, therefore, be forced to import lumber from the Pacific Coast. There is nowhere else for it to come from. Imported lumber means higher priced lumber for the home builder no less than for the citrus grower or the furniture manufacturer.

But, it will be asked, what can the South do about it? With four-fifths of its virgin timber gone, how can it provide permanency for its forest industries? The answer to that question is by the application of forest management to its forest lands. Here in the South you maintain a cotton industry by keeping a certain area seeded to cotton, growing cotton, producing cotton.

Apply that same principle to your forests and your forest lands, and the permanency of your forest industries will, before many years, be as solid and as deeply rooted as your cotton industry.

It is idle and unproductive forest land that today is undermining your forest industries. So long as your area of vacant cut-over land continues to increase and your area of growing forests to decrease, there can be but one answer to the existence of your forest industries. It is a significant thing—first because it shows the productive power of your cut-over lands and second because it indicates the shrinkage of your old growth stumpage—that a quarter of the pine cut of the South today comes from second growth forests, which Nature has brought back on some of these cut-over lands, despite their misuse and neglect. Your second growth pine is today being cut at the rate of $1\frac{1}{4}$ million acres a year, and the Forest Service is authority for the assertion that under present methods of cutting and protection, large areas of this new growth land will not come back to pine.

The question will probably arise in some minds as to the value of this cut-over pine land for other uses. It is true that much of it is agricultural land but much of it is not. The forester does not advocate raising forests on good farm lands. His dictum is, raise forests on lands chiefly valuable for forest growth. If the South will do that, it will maintain in perpetuity its present forest industries and in the course of time gradually expand them. According to the land classification of the United States Department of Agriculture, there are in the pine belt of the southern coastal plain region alone, 36 million acres better suited to growing forests than to farming. For the entire South, the area is much larger. Stripped of their timber, these lands have been abandoned to unrestricted fires, confiscatory taxation

and general human neglect, all of which are fast disposing Nature in her efforts to reforest them. It is merely adding yearly to your 35 million acres of denuded and unproductive land.

On the other hand, the commercial possibilities of regrowth on these southern forest lands are unequalled in any other region in this country. Nature has endowed the South with some of the most remarkable trees in the United States. Your long leaf and slash pines, for example, not only rank first for structural lumber, but they are the source of your naval stores industry, which yield annual products valued at more than \$40,000,000. Their wood is convertible into a great variety of by-products, including industrial alcohol of highest quality, pulp and paper, pine oils, etc. Natural reproduction of the southern pines is simple and easy. Their growth is exceedingly rapid—500 to 1,000 board feet per acre per year, depending upon the quality of the soil. They will yield pulp wood, firewood, railway ties or turpentine crops in 20 to 25 years and merchantable lumber in 30 to 40 years. Apply a conservative growth rate of 400 feet an acre a year to the 36 million acres of pine land in the coastal plain region and you will gain some idea of the productive power of these lands when put under forest management—14½ billion feet of timber growth each year, or more than enough to maintain the lumber industry at its present capacity for all time, to expand your declining naval stores industry and to build up a permanent pulp and paper industry on the forest waste. At present prices, that means an inflow of wealth to the South aggregating over 350 million dollars annually and indefinitely. It means the South's continued dominance of the great lumber markets to the north. It means stability and growth to your local wood using industries, because assurance of a permanent timber crop here in the South will inevitably draw wood using factories from all parts of the North. It may be of interest to you to know that in the seven years following 1912, the lumber cut of the State of New York declined 65 per cent and coincident therewith, 35 per cent of the wood using industries of the State went out of business. And finally, forestry in the South means a very decided commercial advantage to all your industries using wood, in the competitive markets of the world. Whether a Florida orange or a California orange will be served on the breakfast tables of Des Moines, Iowa, a few years hence, may depend on whether your fruit growers can obtain the box lumber locally or must import it from Oregon and Washington.

Because of favorable growth conditions forestry in the South is an exceedingly simple and practicable thing. It involves primarily the protection of cut-over and growth areas from fire and other destructive agents, the taxing of growing timber as a periodic soil crop instead of an annual crop, which it is not, and finally, cutting methods which assure the leaving of sufficient seed trees or young timber to keep the land continuously producing growing forests. Methods of applying these principles will naturally have to vary to meet local problems and local conditions. Restrictive measures, for example, should be imposed upon the promiscuous turpentine of young trees. The naval stores industry, it is

generally admitted, I believe, should be conducted on the principle of getting the maximum yield of gum from the tree at the right time and in the right way instead of on the principle of getting the least out of the tree as soon as possible. Turpentine, correctly done, is a perfectly proper and desirable step in the harvesting of the forest crop. One other point, the grazing of cattle on forest land is not antagonistic to forestry if sanely regulated.

Thus far, my references have been largely to your piney woods but the broader aspects of the situation apply with equal force to your hardwood forests. As to them, it is only necessary to add that the South today contains 61 per cent of the remaining hardwood supply in the United States and in many respects the country is more dependent on the South for hardwoods than for softwoods. There is no great reserve of hardwoods in the West. Today furniture in Grand Rapids, Michigan, is being made from trees which grew near the mouth of the Mississippi River. Keep your hardwood lands which are not more valuable for agriculture, growing timber and the balance of trade in the hardwood market will be with the South.

Whether we talk hardwoods or softwoods, the South's opportunity is equally great. It may be summed up as follows: First, the exhaustion of other forests readily accessible to the great lumber markets of America; second, the strategic geographical position of southern forest lands in relation to those markets; third, your transportation advantages by rail and water over the West Coast, the last great forest reserve in this country; fourth, your long coast line and its favorable shipping routes into the lumber markets of the whole world; fifth, the cheap logging made possible by the easy topography of much of your timber land; sixth, the increasing value of forest stumpage in the eastern United States; seventh, the productive power of southern forest soils and the rapidity with which timber crops may be produced; and finally, a great variety of species of highly commercial value.

But how is forest management in the South to be brought about? There is only one way and that is through leadership and public enlightenment. When the people awaken to an appreciation of the value of permanent forests as they have, although too late, in such States as New York and Pennsylvania, when they are made to realize that the exhaustion of their forests and their forest lands means loss of industries, loss of population, loss of taxes, and loss of wealth, they will provide fire protection, fair taxation, regulatory cutting and other necessary measures. Education is the first forward step. Already much has been accomplished in some of the Southern States, notably in Louisiana. The commercial clubs of the South can render great service to their communities and to their states in bringing home to their people the meaning of forestry and the need for it. Educate your members, educate your neighbors, and above all, educate your legislators. If your State has not a forest department, help crystallize a public sentiment which will create it. It is a cause worthy of your leadership.

MINOR PRODUCTS OF THE MOUNTAINS

By Anna Ross

FAR up in the heights of the Blue Ridge lies a wonderland—a land of mountain peak and deep valley, forest and stream and cataract, mist and cloud and light and shadow—the fairest “that e’er the sun shone on.” The poet, the artist, the botanist and the nature lover find happy hunting-grounds in the delectable hills and the summer time brings its throngs of visitors, some of them gay pleasure-seekers but many more in search of rest and quiet and the life-giving atmosphere of these high altitudes.

The mountaineer is busy at this time in the kitchen, the laundry, the livery stable or garage. But September sees the crowd depart and the mountaineer comes into



BED OF GALAX LEAVES IN JUNE

Note the thick luxuriant growth and flowers in the shape of white spikes.

his own again. He has time to pick up the chestnuts that are falling from the trees, and when October comes with its soft haze and its magical, witching atmosphere, then he—or mostly she—sallies forth in search of the Galax leaf which grows in great abundance in these high altitudes and is much in demand by northern florists.

It is a beautiful, glossy green, about three inches in diameter. It seems to love the society of the graceful laurel and the stately rhododendron. It has other charming neighbors which display their beauty in the spring time—the dogwood with its lovely white blossom and the azalea with its bright yellow or orange flowers, and not far away are oaks, chestnuts and hickory trees, sourwood, sassafras and the tulip, generally known as the poplar.

But Mrs. Mountaineer does not always glean in such pleasant places as she goes “galackin.” She scrambles

up and down rocky cliffs, over old logs and fallen trees, across creeks and through thickets of rhododendron, in search of her harvest. An expert picker will gather from eight to ten thousand leaves per day, for which she gets twenty to twenty-five cents per thousand. At night they are bunched, twenty-five in a bunch, and tied with a stout string. Frequently whole families go to a distant Galax ground and camp for a week or more in little shacks made of boards, picking leaves during the day and bunching them at night, to the accompaniment, perhaps, of the banjo or guitar, which has been brought along.

The leaves are taken to a local dealer who packs them between layers of damp moss in wooden boxes. They are then loaded on a wagon drawn by a pair of horses or mules and carried twenty miles or more down the mountain. If night overtakes them the driver halts in a wide space in the turnpike, builds a fire, produces his frying-pan and coffee pot and some provisions and after the inner man is refreshed the outer man lays him down to sleep in the wagon for the night. Arriving at the railway station, the leaves are shipped to wholesale dealers in the north to be distributed to various points



NATIVE CHERRY OR BLACK BIRCH FOREST

The owner of the oil still stands with his hand on the tree in a jungle of rhododendron, kalmia, hemlock and chestnut oak.

in the United States and Canada. Before the war they were even sent to Europe. They may serve to lighten the gloom at the funeral of some departed New Englander or to heighten the festive appearance of some gay Christmas scene in Philadelphia, besides providing corn bread and coffee and perhaps gingham aprons and tobacco for the inmates of some mountain cabin.

In the higher altitudes grows a tree known as the cherry birch but which the mountain people call mahogany. From this comes a product which many of our readers have tasted, probably never guessing the source of the flavoring in their favorite lozenge. The bark is stripped from this birch when the sap is up and distilled in a wooden still with a metal bottom. This "sure 'nough" birch oil brings two dollars a pound and is used as a substitute for wintergreen. As a rule no attempt is made to utilize the wood of the denuded tree, so this is rather a wasteful method of acquiring a few extra dollars.

Large quantities of tan bark obtained from the hemlock and chestnut oak are also shipped from the mountain country.

I wonder whether folks ever feel any curiosity as to where the materials come from for drugs and medicines. Many of these, of course, are imported, but large quantities of medicinal herbs are gathered in the mountain lands of the south. The area producing these herbs has a much lower altitude than the birch tree heights, varying



BIRCH OIL STILL WITH "PROPRIETOR"

The shed covers the bark just stripped from trees and also the vat from which a trough and pipe conduct the heavy oil to the half gallon glass jar towards right of picture.

from one thousand to three thousand feet in height. Here many varieties of medicinal plants are found. They are gathered mostly by women and children and carefully prepared and taken to the local merchant and exchanged for merchandise. They are passed on to larger dealers in botanical drugs who dispose of them to the manu-

facturers. McGuire and Company, of John City, Tennessee, have a price list of nearly two hundred medicinal roots and herbs, covering a territory that reaches as far



NEARER VIEW OF BIRCH OIL STILL AND OWNER

This shows waste bark at the foot of the tree and a jar of oil at the right.

south as Florida and as far west as Iowa and Michigan. These vary in price from cherry bark at two cents a pound to wild ginseng at eighteen dollars a pound.

It may be added that Mrs. Mountaineer does not forget the home needs when she is preparing her herbs, but in many localities keeps a generous supply on hand for cases of sickness. Butterfly root, or pleurisy root, as it is sometimes called, is one of her favorite remedies. "What is it good for?" I asked an old woman, a fellow passenger on a mail coach, and she told me of its virtues. "Good for a heap of things," was the answer, and went on to tell me it had a "powerful purty" blossom and she had made "many a dollar" gathering it.

I know a grandmother of the highlands who moves softly down the declining years, gently dispensing healing medicines among her own people. She knows the healing powers of the black snake root and sassafras bark, and it is well she does for she is many miles of rocky road from the nearest physician. If her little grandson has an attack of the "whelky hives," she straightway prepares a healing draught that may have as much potency as many of the powders and pills in the pharmacopoeia helping at the same time, to save the pocketbook from a state of collapse.

Still another tree product made by the thrifty mountain housewife is the willow basket. She gathers and peels the willow withes in the springtime when the bark is easily removed and weaves them at her leisure into baskets that are both useful and ornamental. Many of these are eagerly bought by tourists. In some places this industry is encouraged by welfare workers and the baskets are purchased from the makers in the mountains and sent to the cities in the north and middle west for sale.

NORWAY EXPORTS LUMBER FOR AGES AND

EDITORIAL opinion of the country is a unit in demanding action on a national forest policy. Here are editorials on the need of a National Forest policy. One is from Senator Arthur Capper's paper, the *Topeka Daily Capital*, and the other from the *Nashville Banner*. They both point to conditions in Europe. The question should be answered: if little Norway can export lumber for a thousand years, what about the United States?

Topeka Daily Capital: Newspapers generally are strong for "saving our forests" and reforestation, and ought to be. They consume annually in the United States wood pulp equal to 300,000 forest acres. Stretched on a single line the width of an ordinary newspaper the paper consumed would make a streamer reaching about half way from the earth to the sun.

There are some 2 million Americans, however, who are educated in behalf of reforestation and who are heedful how they destroy timber. These are the boys who got to the front in France. A good many of them have paid fines for injury done to trees in the war zone. And they all observed the French forestation system and witnessed the French method of conservation. A French forest, or a German, consists of alternating rows of trees in every stage of growth from the youngest seedling up to the mature trees. The latter are constantly being hewn down for lumber, but for every tree taken out a seedling is put in the ground, and as fast as the large timber is cut the next stage of timber becomes ready for the ax and saw. Witnessing this intelligent process of preserving French timber while using it, the average American service man obtained such a sense of conservation that he will be careful about wasting growing timber at home and will be strong for the program of the government and the American Forestry Association for reforestation in the United States.

Michigan's white pine forests, once among the most splendid on the globe, have been ruthlessly destroyed, with no reforestation and consequently Michigan and other states about the Great Lakes which a generation ago shipped millions of tons of

white pine to the South and West, are now paying heavy freight charges for lumber from Texas and Oregon to Michigan. Under the French or German system Michigan's forests would be intact today. The waste of American primeval forests has been an example of American pride in immediate and temporary "prosperity," which shows big for the time being, but an example also of its carelessness of generations to come after.

Nashville Banner: The United States Department of Commerce has recently issued a report on "Norway's Forests and Lumber Trade," in which it is shown that

THE ETERNAL FEMININE



—McGill, in the Atlanta Georgian.

Norway has been extensively engaged in the export lumber trade for over 1,000 years; that this is at present one of the country's most important industries, with nothing to indicate that the forests are about to be exhausted.

Two paragraphs from the report follow:

Norway started in the lumber export trade 600 years before Columbus landed in America. The industry has developed until today it is one of the country's most important sources of income. Adequate shipping facilities, careful attention to waste elimination and development of the planing mill industry to a remarkable degree of efficiency, supplemented by the country's position close to the principal markets of the world, with ice-free ports

throughout the year, are some of the reasons for its important place among lumber export countries, according to Trade Commissioner Axel Oxholm of the department of commerce, in his latest special report.

The lumber problems of Norway and the United States are much the same, says the trade commissioner in advancing the opinion that American lumbermen can learn much of interest from a study of what the Norwegians have done and are doing to "squeeze all waste out of the business and to make every effort count. He says the scientific utilization of so-called waste

products is largely responsible for the greater profit realized by the lumbermen of that country in international trade.

This shows in concrete form what is the result of scientific prosecution of the lumber business, and scientific conservation of the forests where the lumber grows.

With the continuation of present methods of criminal destruction in America, who is foolish enough to suppose a single sawlog will be found in the United States outside a museum one thousand years hence.

Providence Journal: Americans are no less intelligent than the people of Europe; all that is necessary is to impress upon them the fact that unless something is done at once the country in a few years will

be unable to get lumber except at prohibitive prices and eventually cannot find it at any price.

The American Forestry Association is doing praiseworthy work in broadcasting the facts on our timber supply. But something more than publicity campaigning is needed. There must be action. The time to plant trees is now. The longer reforestation is postponed the greater will be the public loss. Too long we have been paying the penalty of waste and neglect.

Rochester Democrat Chronicle: When a \$10 bill is counterfeited the government expends prodigious effort and unlimited money to run down the counterfeiter, and if caught he is given a long sentence in prison. If he has had exceptional luck he may have

IS STILL AT IT; WHAT ABOUT UNITED STATES?

swindled the government out of a few thousand dollars. A man maliciously or through carelessness starts a forest fire which destroys a million dollars worth of timber, but not a thousandth part of the effort and expense, is devoted to capturing and punishing him that was given to the insignificant counterfeiter. That is just one instance in which a mighty improvement could be made. One who starts a forest fire through malice or carelessness—for there should be no difference recognized in these crimes—ought to receive far greater punishment than a counterfeiter.

Lansing Capital News: The American public's duty to protect and scientifically develop forests and plant lands most suitable for tree growing is so evident, according to the American Forestry Association, that it seems a shame conservationists should be compelled to use the tremendous efforts they are compelled to employ for arousing public action.

The need of reforestation is not all talk. It is real, and more and more as the cost of wooden construction goes up, we realize the harm our forbears did in wanton waste in the cutting of our timber supply and their neglect to take means to replace this supply for the benefit of the generations which followed them.

It would seem that now is the time for the American people to quit worrying over whether the flapper is going to the eternal bow-wows and whether our neighbor is making booze in his cellar and settle some of the big questions which confront us. And the matter of reforestation is one of the biggest, if not actually the biggest, with which we are compelled to wrestle.

Atlanta Constitution: By our procrastination we are not only hazarding an important industry, but we are blindly ignoring nature's ability and willingness to reclothe millions of acres, valuable chiefly for their timber production capabilities, with forests that would be a perpetual source of revenue through the years to come.

Chicago Tribune: The need of timber conservation and reforestation in the United

States is generally admitted. It requires no argumentative support. What it does require is financial support. Men who own or control forests are eager to sell them or their product to enjoy the advantages which the money would bring. Men who do not own them do not care to plant them because a forest is a crop which requires fifty years or more to develop sufficiently to assure a profit and in this day we do not want to wait so long for our money.

That being the case, the business of establishing "town forests" which is advocated by the American Forestry Association, is of interest. A man grows old,

in better and more productive condition than it is today.

Some European cities have had town forests for centuries and are still enjoying a regular profit from them. Fitchburg, Mass., is said to have the first legally established town forest in the United States. Petersham follows. Still others will follow. The more the merrier. The plan takes away from forestry its chief objection—that the man who plants may never live to reap. The town which plants will live to reap. If enough towns plant they will save to the country one essential natural resource which is now in imminent danger of being totally destroyed.

The American Forestry Association wants to help every town get a start. Cook county, in a way, has a start in its forest preserves, though they are not designed primarily for timber producing purposes. We believe it will pay towns throughout the country, particularly those near barren soil, especially adapted to forestry, to look into the subject. It might even pay the government to help them.

Dallas News: Fires make unburned forests more precious to their owners, and therefore more costly to those of us who use their products. Ethically, it is probably the duty of the owners of the private forests to protect them from fires, but it is evident that they are under a smaller economic inducement to do so than are the buyers of lumber. It is the buyers of lumber who foot the damage done by forest fires.

New York Herald: The Southern States are leading the country in teaching forestry in the public schools. The Tennessee law, which is described in *American Forestry* for May, is very explicit and comprehensive in its provisions covering this subject.

It requires the curriculum of every public school in the State to provide for the study of forestry and plant life. The American people have long needed forestry education. Their country has suffered severely and is still suffering, from the lack of it. Education on the subject of the preservation of our timber resources is needed from the ground up, and the bed-rock on which to lay the foundation of that education is in the public schools.

GOING, GOING—



—Smith, for the Newspaper Enterprise Association.

perhaps dies, in fifty years. He cannot plant a tree or a grove with any probability of living to enjoy the timber which it will produce. A town, on the other hand, is young at 50 years and perhaps even at 100 or 200 years. A town can plant forests, tend them, and profit by them.

Petersham, a New England village, is trying the experiment. It has turned its 250 acre poor farm into a town forest. The pine stumpage of thirteen acres already has been sold for \$5,200. One hundred acres, now bare and unprofitable are to be planted to trees which will be ready to cut for timber in fifty or sixty years. It is estimated that \$50,000 can be taken from this forest in that time and leave it

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ILLINOIS FORESTRY ASSOCIATION

The Illinois Forestry Association was organized on April 28th at the club rooms of the Lumbermen's Association of Chicago. Mr. Bolling Arthur Johnson, editor of the Lumber World Review, and Mr. William L. Hall were the moving spirits in bringing about this organization. A constitution similar to that drafted by Missouri was adopted and the following officers were elected: President, Dr. Henry C. Cowles, University of Chicago; First Vice President, Bolling Arthur Johnson editor Lumber World Review, Chicago; Second Vice President, Prof. J. C. Blair, Department of Horticulture, Urbana, Illinois; Secretary, Mr. S. F. D. Meffley, Secretary-Manager, Chicago Lumbermen's Association of Chicago; Treasurer, Mr. George A. Pope, of Chicago. The Association started with thirty-five charter members and this number will be increased as rapidly as possible.

LIGHTNING CAUSES MANY FOREST FIRES

Lightning may not strike twice in the same place although it strikes with surprising regularity, as shown by forest fire statistics just compiled by the Forest Service. The figures show that during three of the past five years there were 201, 191 and 197 forest fires on the National Forests of Arizona and New Mexico due to lightning, although during the other two years, which were unusually dry, there were considerably more. This small variation of only 10 fires during the three years, indicates, according to Forest Officers, that lightning presents a fairly constant forest fire risk.

Forest Officers point out the fact that lightning does not always start forest fires since a great deal of it occurs during heavy showers, especially in July and August. Heavy electrical displays during such storms are responsible for many lightning-struck and often shattered trees. Fires rarely start at such times because of the heavy downpour of rain. During June and often the early part of July, however, there are dry electrical storms. The skies cloud up and there is a great deal of lightning and terrific thunder, although little or no rain falls. During such storms, many trees are struck by lightning and forest fires often result. It is not at all uncommon for three or four fires to start in one locality from storms of this kind and as high as 10 fires have been known to start.

Fortunate for the protection of the forests, the Forest Service fire organization always has sufficient warning of the coming of such fires. At the first clap of thunder, the entire organization is on its toes and horses are saddled and packed with provisions and tools. In fact, the rangers are ready to go as soon as fires are reported by the fire lookouts.

Experience has shown also that lightning fires do not at first spread as rapidly as those caused by man. Ordinarily they smolder for some time at the base of the tree struck, although when once the grass and debris under the tree catches fire, the spread is rapid. This is why the rangers are so anxious to get to the lightning fires quickly. Getting them while small not only saves a lot of forest from destruction but it also saves the rangers a good deal of work.

Man-caused forest fires, on the other hand, ordinarily spread more rapidly from the start and no warning as to when they will happen is given the rangers. These fires are, therefore more difficult to get to as quickly as lightning fires and often harder to control after arrival. On the other hand man-caused fires are generally in accessible country, along roads and trails where they can be easily reached, whereas lightning may strike anywhere, often in country difficult of access.

Studies have shown also that lightning

fires occur most frequently in certain zones. Parts of the National Forests of the Southwest have practically never had lightning fires while other localities have repeated fires from this cause. Such areas are being definitely located as quickly as sufficient information is gathered and the Forest Service fire organization is being constantly modified to take care of these emergencies.

NORTH IDAHO'S FIRE HAZARD

THE fire hazard in the forests of North Idaho is worse than in any other portion of the United States, says C. C. Delavan, Fire Assistant on the Coeur d'Alene National Forest, in a lecture on forest fire protection which he recently gave to the students of the School of Forestry of the University of Idaho, at Moscow, Idaho.

Mr. Delavan has made a detailed investigation of the climatic factors affecting the fire hazard of this region in conjunction with Mr. J. A. Larsen, U. S. Forest Examiner in charge of the Priest River Experiment Station, at Priest River, Idaho. This study showed that although North Idaho's annual rainfall is much more abundant than that of many other sections of the country, its distribution is very uneven and there is practically none during the hot summer months of July and August. At the season when the rainfall is least, the wind movement is greatest and westerly in direction. These westerly winds, having lost their moisture in traversing the Cascades, and having been warmed up without reabsorbing moisture in crossing the deserts of central Washington, strike North Idaho forests with a powerful drying effect and observations actually show that the relative humidity in summer at Spokane is less than that of the Sahara desert. Thus we have the minimum of rainfall and humidity occurring when the wind movement, air temperature, sunshine and evaporation are greatest, a combination of factors which put the forests in a most inflammable condition.

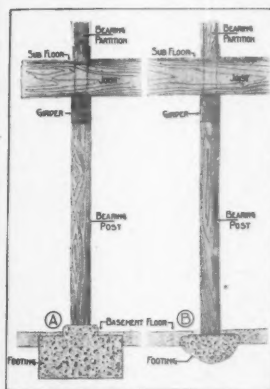
Southern California has equally severe summer climatic conditions, but there the fire problem is not so serious because the spring rainfall is much less, the forests more open in character and the amount of inflammable material on the ground much less. In North Idaho, the abundant spring and fall rains give rise to a very dense type of forest which creates an abundance of inflammable material and enables the fires which occur to burn fiercely and spread rapidly.

In dealing with this most serious problem, Mr. Delavan pointed out the necessity for care and active co-operation on the part of the public to prevent fires from starting, to extinguish all fires discovered, no matter how small, and to enforce the state and federal fire laws.



NEW ENGLAND COLONIAL STYLE

Illustrating the symmetry and stateliness of New England town houses of the period when Colonial architecture was at its height. This is another of the 17 architectural styles illustrated and discussed in "Good Houses," a book for home-builders interested in good design, efficient planning and thorough construction. "Good Houses" interprets those architectural styles which are the foundation of American building traditions, and which are adaptable to wood construction today. Send for your copy today.



Illustrating Good and Bad Bearing Post Footings

IF bearing posts under the girders in the basement of a house settle unduly the effect is apparent throughout the house. Cracks appear on plastered walls; doors become troublesome; floors become uneven. The bearing posts support a considerable amount of the weight of the house. Obviously they must be well supported or "rooted."

The footing shown on the right is too small in all its dimensions and is limited in its bearing power by its shape as well. Note how the post is set down into the concrete, a material which is always somewhat damp, thus needlessly subjecting the post to decay.

The greater sustaining power of the footing on the left is evident at a glance. Note its generous dimensions, its flat bearing surface, and note, too, how it extends above the cellar floor line, thus keeping the bearing post off the damp floor.

The success of concrete footings is dependent, too, upon the use of good materials in the right proportions, properly mixed.

Bearing post footings are just one of the many vital points in successful house building discussed in the booklet — "The High Cost of Cheap Construction," sent free on request to prospective home builders.

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Weyerhaeuser Forest Products are distributed through the established trade channels (to contractors and home builders through the retail lumber yards) by the Weyerhaeuser Sales Company, Spokane, Washington, with branch offices and representatives throughout the country.

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PENNSYLVANIA'S FIRE OBSERVERS

Forest fire observers employed by the Pennsylvania Department of Forestry are now on duty, day and night, in small glass-enclosed cabins on the sixty-eight steel towers that have been erected on mountain tops in various parts of the State. They are guarding the State's timberlands, both privately-owned and State controlled, from destruction by fire.

The observers have been equipped with the most approved appliances and instruments for the location of fires. Maps have been prepared showing all the mountain peaks, streams, valleys, ravines, towns and other features that lie within the range of the watchmen's vision. In some cases all the territory within twenty miles of the tower is shown on the map, and it is under the constant observation of the forest guardians.

The maps are mounted on revolving tables in the cabins, and in the center of the map is an alidade, an instrument set on a pivot so that it may be swung in any direction and sighted on a fire. This instrument shows the exact location of the fire, with reference to topographic features on the map. Arrows indicate the direction and distance to principal cities in the East.

Towers, as far as practicable, have been placed so that they cover virtually all the forested area within a given region. Sometimes the outlying territories visible from nearby towers overlap, thereby providing increased protection against fires.

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NEW JERSEY NEWS NOTES

Alfred Gaskill, State Forester and director of the State Department of Conservation and Development of New Jersey, tendered his resignation to take effect July 1. Charles P. Wilber, of Trenton, Fire Warden, will probably become State Forester. Gaskill's retirement is due to ill health.

Gaskill studied forestry at Harvard University, the University of Munich and in organized forests of Europe. He entered the United States Forest Service in 1901 and on February 1, 1907, was engaged as State Forester. He was a director of the American Forestry Association for a number of years.

Practical forestry has been adopted by the East Orange, Water Department for its 2,000-acre watershed in Essex County. Approximately 1,400 acres of the land is covered with natural timber and is being systematically cleaned of undesirable growth. Of the remaining area, 400 acres will be planted with forest trees at the rate of about 50 acres a year until all the idle land has been put to work. This spring 38,000 young trees of pine, spruce and black locust were set out. Over 50 acres were planted about 10 years ago and now have become fine stands of pine and spruce, some of the trees being more than 25 feet tall and 4 to 6 inches in diameter. A 40-acre tract on the watershed has been leased to the Boy Scouts of East Orange for a permanent camp.

A course in forestry, with special reference to the farm woodlot, is being given this year for the first time to agricultural students at Rutgers College, New Brunswick, N. J., by foresters from the State Department of Conservation and Development. This course will consist of four lectures and a field trip.

"There is no need of a forestry school in New Jersey," said C. P. Wilber, state forester, "but forestry is fast being recognized as a part of present day farming."

A new 60-foot steel lookout tower, which will guard one of the largest wilderness areas in New Jersey, was recently erected by the State Forest Fire Service near Millville. Two more towers, one at Lakewood and one near Blairstown, will soon be opened.

Plant Memorial Trees

PULPWOOD IN PENNSYLVANIA

The Department of Forestry has just completed a survey of the pulpwood situation in Pennsylvania. This study shows which used 320,076 cords of wood during that there are 13 pulp mills in the State, 1921. This was a decrease of almost 35 per cent from the 1920 consumption, when 489,211 cords were consumed.

The pulp and paper business is one of the most important of Pennsylvania industries that depends upon the forest for its raw material. More than \$50,000,000 are invested in the pulp mills. Last year they employed 7,000 people, paid out \$10,000,000 in wages and turned out products valued at \$20,000,000.

The principal kinds of wood used by the mills are 99,559 cords of spruce, 63,355 cords of yellow pine, 40,263 cords of poplar, 38,753 cords of beech, birch and maple. The remainder was made up of Balsam fir, yellow poplar, hemlock, gum and sycamore.

The most striking feature of the pulpwood situation is the fact that more than 72% of the wood used in the pulp mills comes from outside of the State and less than 28% comes from within the State. Three of the pulp companies import every stick of wood they use, 8 of the 13 companies import over 60% of their wood, while not a single company relies entirely upon home-grown wood. This makes the pulpwood situation serious, for the Pennsylvania mills cannot depend indefinitely on Canada and other neighboring states for pulpwood. These outside supplies are being depleted. There is only one practical way to bring relief, and that is to grow the wood on the hills of Pennsylvania.

The Department's investigation shows that one of the most promising signs of the Pennsylvania pulpwood situation is the use of mill waste. Wood that was formerly discarded is now used on an increasing scale. Mill waste, slabwood and mountain wood are finding their way into the mills. During 1921 a total of almost 43,000 cords of this kind of material was used. It made up more than 13% of the total wood consumption of all the mills. Among the material used were old logs that had been lying in the woods for twenty years.

Experts of the Department of Forestry estimate that 500,000 acres of well-managed forest land will be required to maintain the pulp mills of Pennsylvania, and supply them continuously with wood. The pulp companies now own 86,000 acres of forest land in Pennsylvania. If this area is handled properly it will produce a large quantity of pulpwood. The State Forests, which now exceed 1,126,000 acres, will also supply considerable material and the privately owned forest land will make up the rest. These three sources of supply will go a long way toward supplying wood

needs of the Pennsylvania pulp mills and help maintain this important wood-using industry.

ORNAMENTAL TREES

Evergreen trees form one of the most effective classes of ornamental plants. They can not be used as extensively as deciduous trees as they are more exacting in their requirements of soil, exposure, etc., and their very individuality is often a reason for planting them sparingly, according to Prof. Alan F. Arnold, of the New York State College of Forestry. For many purposes, however, they are invaluable, but the owners of homes generally know little of their ornamental possibilities. A great deal of the planting of evergreens that is done on small lots particularly, is attended with unfortunate results. This is due largely to a lack of knowledge as to what trees are most likely to do well.

SAVING THE TREES OF BROOKLYN

HOW to save the trees of Brooklyn by careful forestry practice is a problem which has been submitted to the New York State College of Forestry at Syracuse by prominent Brooklyn men as the result of a street tree investigation made by the head of the department of City Forestry at the State College.

It is suggested that an area of Brooklyn streets be taken, planted and maintained as a joint experimental problem for the period of at least ten years by the State College of Forestry and the Brooklyn Botanic Garden, carried out by funds supplied by interested citizens of Brooklyn. It is said that the trees of Central Park have been in danger of dying out entirely and the Brooklyn proposition is the result partly of the College's forestry work on these trees.

SLASH PINE REVENUE

Slash pine grows rapidly and yields revenue in turpentine gum at an early age while it is growing into timber, says the United States Department of Agriculture in Farmers' Bulletin 1256. Slash Pine, prepared by Wilbur R. Mattoon, forest examiner, and now ready for distribution. Well-stocked stands of young growth, after making liberal deductions for the cost of taxes and fire-protection during the period of growth, show profits of 6 to 12 per cent compound interest on an investment of \$5 an acre. A large number of owners in the South are deriving good profits from low-priced lands by using them for the production of timber and grazing of stock. If fire is excluded, the range yields more of the tender annual grasses and legumes which are more nutritious than the hardy perennials like wire and broom-sedge grasses, and the influence of the protective soil cover stimulates tree growth to a marked degree.

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BOOK REVIEWS

"Timber," by Harold Titus (Small-Maynard), Boston, Price \$1.75.

In Michigan the need for forestry is very great but the task of getting people sufficiently interested to do anything about it is an exceedingly discouraging one. There has recently appeared, however, a book which carries a big forestry message to the people of Michigan and which should be tremendously helpful in advancing the cause of forestry in that State.

The name of the book is "Timber." It is a novel and the story is laid in Michigan's great "cut-overs." The author has distinguished himself by writing an intensely interesting and human story and by weaving into it the true essentials of forestry in a simple and understandable way.

"Timber" is a distinct contribution to the cause of forestry in the United States. The fact that the story is woven into conditions in Michigan does not detract from the broad application of its lesson. It will carry the gospel of forestry wherever it is read and needless to say, it will be read by the public. The same cannot be said of much of our other forestry literature which unfortunately is in government re-

ports, convention proceedings and professional journals. We need more novels like "Timber."

Government Forest Work, United States Department of Agriculture. Department Circular 211.

This illustrated pamphlet of 47 pages is a convenient pocket reference book, covering, as the name implies, the forest work of the Federal Government. It is prepared for free distribution and will supply the ever increasing demand of those who wish to be furnished with authentic information in regard to the promotion of scientific forestry which is coming to be recognized as a matter of vital concern to every American. Scientific forestry was first begun in the United States in the Department of Agriculture and this work has ever since been carried on by the Forest Service, of the Department of Agriculture, in co-operation with other bureaus of the Department. The Bureau of Public Roads assists in opening up ways for more efficient fire protection, and the Bureaus of Entomology and Plant Industry aid in protecting the forests against insect enemies

and disease. The Forest Service also co-operates with the Bureau of Animal Industry, the Weather Bureau, Biological Survey and other federal agricultural agencies.

Efficient administration of the 156 million acres included in the National Forests for the greatest benefit and service to the people involves many activities besides the growing of trees. The keynote of the National Forest administration is service, and the demands of the persons who wish to seek rest and recreation within the forest boundaries are recognized as well as the demands of the lumberman, the settler, and the stockman. These various demands on National Forest resources are oftentimes conflicting and difficult to settle, but the guiding principle of the highest use is followed. For the campers, recreation areas are set aside, and those who wish to build summer homes and return to the same place each year may lease sites for a very reasonable sum.

The Booklet is for free distribution and may be obtained from any forest supervisor and the District Forester's office in Portland, Oregon.

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STATE NOTES

FOREST PRODUCTS IN TEXAS

After house construction the most important user of forest products in Texas is the oil industry, according to a table just issued by the State Department of Forestry and the Texas Forestry Association. For dwellings the annual consumption of forest products in this state is estimated at 325,000,000 feet; for the oil industry it is 315,000,000 feet. There are said to be 13,000 producing wells in Texas and about 30,000 feet of lumber are required for each well.

It is estimated that the annual consumption of forest products for all purposes in the state is 1,900,000,000 feet.

\$165,000 FOR NEVADA ROADS

Expenditures totaling \$166,000 of National Forest Highway funds for the construction and repair of 24 miles of roads in Nevada have just received the approval of Secretary of Agriculture Wallace. This money was made available for roads serving the National Forests and for roads within or adjacent to the forests, which are of primary importance to States, counties and communities. The amount approved by the Secretary will be allotted to two roads in the Toiyabe National Forest in Lander County and one in the Nevada National Forest in White Pine County.

INSECT ATTACKS BIRCHES

Birch trees in certain sections of Maine are being attacked by an insect which defoliates them, and it has been identified as the buccalatrix, an insect about a quarter of an inch long, which feeds with the utmost abandon on the leaves of the birch. The remedy for this pest is announced as arsenate of lead spray, to be done in the spring or by the first of July.

Deputy Forest Commissioner Neil L. Violette, asked about the damage, if any done by this pest, said that the presence of the insect in certain sections had been reported to the department, but that the only damage so far known to have been done by it was the defoliation of the trees. That, of course, makes an unsightly appearance, but has not, so far as known, injured the trees themselves. It is understood that a parasite is making great inroads on the ranks of the insect and it is hoped that the pest will be thus exterminated.

PULPWOOD CONSUMPTION BREAKS RECORD

The 1920 consumption of pulpwood in California, Oregon and Washington exceeded by 23,000 cords, or 7.4 per cent the greatest previous record, which was in 1919. Similarly the 1919 consumption of pulpwood exceeded by 18.6 per cent that of 1917, the previous record. The 1919 production of wood pulp fell short of the 1917 production by nearly 3 per cent, while the 1920 production exceeded the 1917 record by 14 per cent.

This statement is based upon complete figures published jointly by the Bureau of the Census for 1919, and the Forest Service of the United States Department of Agriculture, in co-operation with the American Paper and Pulp Association, for 1920.

\$61,000 FOR BLACK HILLS ROAD

Secretary of Agriculture Wallace has approved the expenditure of \$61,000 of National Forest Highway Funds for road building on the Deadwood Hot Springs Highway in Pennington County, South Dakota. This money was made available for roads serving the National Forests and for roads within and adjacent to the forests, which are of primary importance to States, counties and communities. The section to be constructed lies between Pactola and Merritt in the Black Hills National Forest and will cover a distance of 6.6 miles.



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FOREST SURVEY IN ILLINOIS

The State Natural History Survey of Illinois, a Division of the Department of Registration and Education has now in active progress a systematic survey of the forest areas of the state, carried on by a party of trained foresters, who are making careful counts and measurements of the different kinds of trees on sample strips or plots to get the data for a computation, for each kind of trees, of the number of board feet of merchantable timber per acre, and the number of cubic feet per acre, suitable for railroad ties, mine props, fire wood, etc. The information obtained will be published,—together with general descriptions illustrated by photographs and maps, of the kinds and condition of the various forest areas,—in the bulletin of the State Natural History Survey. Other studies are being made of the rate of growth of the different species of trees on different soils and under different conditions as to subsoil, slope, and drainage, the whole investigation being in the nature of a stock-taking of Illinois woodlands for a determination of their value as public and private resources.

Statistics are also being collected of the consumption of timber by the different wood-using industries of the state, the local supplies available for each, and the time which these will last at present rates of use.

The forest survey will also report upon the kinds of management necessary to maintain production, the most important of which is evidently protection against damage by fire. These studies will presently be extended to deforested areas in order that normal agricultural lands may be clearly distinguished from those which should be kept in forest or restocked with trees as the most profitable use to which they can be put. The survey party is now at work in the forested area of extreme southern Illinois, but will later extend its operations along the Mississippi bluffs and over the broken lands bordering the more important streams within the state.

PLAYGROUND FOR BUTTE

The first law authorizing the Secretary of Agriculture to co-operate with a municipality in the development of playground areas was enacted on April 28, when President Harding signed a bill recently passed by Congress empowering the Secretary to set aside for the recreational development of Butte, Montana, a tract within the Deerlodge National Forest. According to a statement issued by the Forest Service of the United States Department of Agriculture the area is desired by the City of Butte for a playground. The city has been reluctant to construct improvements because National Forest lands are freely open to mineral prospecting and the location of claims on the proposed area would destroy its value for outdoor enjoyment.

American Forest Regulation

By Theodore S. Woolsey, Jr.

Limited edition, paper cover, \$2.75 net, \$3.00 postage prepaid (cloth, \$3.50); about 230 pages (6x9 inches).

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GLACED GRASSHOPPERS

"Very much unheard of before," one of the glacier experts of the Geological Survey said skeptically when recently shown reports and photographs of the Grasshopper Glacier which lies just outside of the northeast corner of the Yellowstone National Park.

However, the glacier is there for any one to see. Imbedded in its ice there are thousands of strata of grasshoppers of an extinct species, which must have been flying over the mountains in living clouds when they were caught in snowstorms and killed, later to be preserved for countless years in solid ice.

The Glacier which lies in great cirques at the head of Rosebud River is comparable to any of the big glaciers of the Rockies. It is a safe glacier, having few crevices. The view from the glacier is sensational due to the towering sawtooth mountains about it, and the yawning canyons of the Rosebud below. The trip to this glacier is worth while in every respect and is best reached from the Yellowstone Park as a side trip from Tower Falls Junction. Motorists can drive to Cooke City from which point horses and guides for the glacier trip can be secured.

\$367,000 FOR STATE ROADS

Expenditures totaling \$367,000 of National Forest Highway funds for the construction of 64 miles of highway in New Mexico have just been approved by Secretary of Agriculture Wallace. This money was made available for roads serving the National Forests and for roads within or adjacent to the forests, which are of primary importance to States, counties and communities.

ATTENTION, FORESTERS

AMERICAN FORESTRY will print, free of charge in this column, advertisements of foresters wanting positions, or of persons having employment to offer foresters. This privilege is also extended to foresters, lumbermen and woodmen who want positions, or to persons having employment to offer such foresters, lumbermen or woodmen.

POSITIONS WANTED

WANTED—Positions by three High School Graduates for forestry work or woods work for the summer. Salary or location no object. Experience wanted. Box 3085, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (4-6-22)

GRADUATE LANDSCAPE FORESTER, experienced in both municipal and private forestry and landscape engineering desires position with a municipality or private concern. Address Box 3095, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (4-6-22)

"LAND OWNERS, are your holdings burdensome? Perhaps there is a better way of getting an income from them or turning them into cash than has yet occurred to you. It will cost you nothing to talk your troubles over with a LAND SPECIALIST, temporarily unemployed, with 35 years' experience at lumbering, forestry, farming and agricultural organization in the Northwest. Write description of location, topography, soil, etc., in reply." Box 4010, care AMERICAN FORESTRY MAGAZINE, Washington, D. C.

FORESTRY COLLEGE GRADUATE, 22, single, willing and capable, wants work with a forest products company or a research party. Not particular which part of world duties will lead to. Address Box 4000, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (5-7-22)

GRADUATE FORESTER—Experienced; eight years state forest management, four years nursery, landscape and horticultural work, desires connection with firm or individual interested in forests or nurseries for commercial purposes. Address Box 4020, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (6-8-22)

POSITION WANTED BY A TECHNICALLY TRAINED FORESTER at present employed as forest manager on one of the biggest private estates in Pennsylvania; 35 years experience. Can furnish the best reference. Address Box 4030, AMERICAN FORESTRY MAGAZINE, Washington, D. C. (6-9-22)

FORESTER, University Graduate; 23 years of age; ex-service man; several years' experience in the paper industry as an executive, also sales experience, desires position. Best references. Address Box 4040, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (7-9-22)

YOUNG MAN, 32 years old; married; graduate of Cornell University; B. S., 1914; M. F., 1915, with five years' experience in the United States Forest Service. Desires position as forester with a lumber company or private estate. The best of references. Address Box 4050, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (7-9-22)

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WANTED—A graduate forester of four or five years' experience. Eastern preliminary education preferred. Good salesman, excellent talker. To do educational extension work. Address Box X-22, care AMERICAN FORESTRY MAGAZINE, Washington, D. C. (4-6-22)

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Bryant's Logging

The Principles and General Methods of Operation in the United States. By Ralph Clement Bryant, F.E., M.A., Manufacturers' Association, Professor of Lumbering, Yale University, 590 pages, 6 by 9. 133 figures. Cloth, net, \$4.50

A discussion at length of the chief facilities and methods for the movement of the timber from stump to manufacturing plant, especially logging railroads.

MICHIGAN AGRICULTURAL COLLEGE FORESTRY SUMMER CAMP

The Forestry Department at Michigan Agricultural College announces that its annual summer camp for junior foresters will be held on the forest lands of the Antrim Iron Company, a company operating a large saw mill and chemical wood plant in Kalkaska County, Michigan, starting the 26th of June and lasting for four weeks. This camp is an annual institution of the Forestry Department. The students live in a logging camp and put in old fashion lumberjack hours in the woods learning the business of timber cruising, land surveying and logging from the ground up. A lumber camp cook provides them with simple but abundant fare of the quality that is provided for lumberjacks.

A CONSERVATION COUNCIL

A State Conservation Council for Pennsylvania was organized March 30-31, at State College, Pennsylvania, by twenty-one State and nine county organizations interested in conservation, representing over 275,000 people. The object of this Conservation Council is to outline a conservation policy for the State, to correlate the efforts of the many State and county wide organizations interested in various phases of conservation and to secure uniformity of action for the support of such measures as are deemed important for the advancement of conservation.

Among the organizations represented at the meeting were: The Pennsylvania Branch of the Wild Flower Preservation Society, Pennsylvania Forestry Association, United Sportsmen of Pennsylvania, State Chamber of Commerce, Wild Life League, Pennsylvania State Conservation Association, Pennsylvania State Sportsmen Association, Pennsylvania Alpine Club, State Grange, State Federation of Pennsylvania Women, Society of Farm Women of Pennsylvania, the Kiwanis Clubs, Boy Scouts of America, Botanical Society of Western Pennsylvania, the Pennsylvania State Fish and Game Protective Association, Pennsylvania Branch, Society of American Foresters, Rotary Clubs, Centre County Conservation Association, Columbia County Conservation Association, Berks County Conservation Association, York County Conservation Association, Union and Snyder County Game, Fish and Forestry Association, Anthracite Forest Protective Association, Huntingdon County Conservation Association, Lycoming County Forest Protective Association, Pocono Forestry Association, Blair County Game, Fish and Forestry Association, Clinton County Fishing and Hunting Association, Bucks County Fish, Game and Forestry Association, and Montgomery County Fish, Game and Forestry Association.

A Constitution was adopted which gives each State-wide organization three representatives on the Conservation Council and

each county one representative. The county representative is to be elected by a County Conservation Federation of all organizations in a county interested in conservation. The Conservation Council will thus be composed of about 130 representatives. The organization members are to retain their own individuality and traditions, but to combine their efforts through the Conservation Council for developing conservation along the lines of hunting, fishing, forestry, wild flowers, song birds, recreation and education in conservation.

Officers were elected as follows: President, Dean R. L. Watts, of the School of Agriculture, State College, Pa.; vice presidents, Miss Florence Dibert, Johnstown, Pa., chairman of the Conservation Section of the State Federation of Women; R. L. Brown, Ellwood City, Pa., president of the Wild Life League of Pennsylvania; David Prichard, Scranton, Pa., president of the United Sportsmen of Pennsylvania; secretary, Prof. J. A. Ferguson, State College, Pa., secretary Pennsylvania Branch, Society of American Foresters; treasurer, M. I. McCreight, Dubois, Pennsylvania Conservation Association.

The meetings were addressed by A. B. Farquhar, of York, Pa.; Dr. J. T. Rothrock, West Chester, Pa. Hon. R. Y. Stuart, State Forestry Commissioner; Hon. N. R. Buller, State Commissioner of Fisheries, and Hon. Seth Gordon, Secretary of the Board of State Game Commissioners, outlined the future policies of their departments, which were adopted by the Conservation Council.

Resolutions were adopted in favor of the purchase of land by the United States Government for the creation of National Forests in the East; bonding the State for \$25,000,000 for the purchase of wild land of the State; appropriation of \$1,000,000 for fire protection in the State; against the proposal to unite the Department of Forestry, Fish, Game and Water under one commission; against the proposal to turn license money from hunters and fishermen into the general treasury of the State, and in favor of the United States Government in cooperation with the States carrying on investigations to stop pollution of our rivers and streams.

DECAY OF BUILDING TIMBERS

Fungi that attacks timbers in buildings cause enormous losses every year, particularly in textile mills, paper mills and canning factories, here moisture and temperature conditions are unusually favorable to their growth. The problem has become more serious with the increasing use of woods of poorer quality, and the United States Department of Agriculture has taken it up with a view to reducing the losses. Department Bulletin 1053, Studies of Certain Fungi of Economic Importance in the Decay of Building Timbers, by Walter H. Snell, has just been issued.

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